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# Food Technology Abstracts

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# FOOD TECHNOLOGY ABSTRACTS

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## GENERAL

1928 RUF (F). Food quality assurance: A task for the present and a challenge for the future. **Dtsch. Lebensmittel-Rundsch.** 81(10); 1985; 307-16

1929 KROESBERGEN (HT), VISSER (W) and GLERUM-van der LAAN (C). The attention given to the label. **Voeding.** 46(3); 1985; 104-9 (Dutch)

Purchasing habits of 500 people, in relation to 6 foodstuffs, were studied. The consumers showed a special interest in brand name and price. Very few paid attention to durability (or shelf-life), date of minimum durability, weight, and nutritional value. Many people know that the label contains a list of ingredients used to make the food, but very few show any interest in it. KMD

## FOOD PROCESSING AND PACKAGING

1930 BERRY (MR) Jr. and BRADSHAW (JG). Comparison of sterilization values from heat penetration and spore count reduction in agitating retorts. **J. Food Sci.** 51(2); 1986; 477-9, 493

1931 DATTA (AK), TEIXEIRA (AA) and MANSON (JE). Computer-based retort control logic for on-line correction of process deviations. **J. Food Sci.** 51(2); 1986; 480-83, 507

## FOOD ENGINEERING AND EQUIPMENT

1932 BEN AIM (R) and DAVIN (A). The different filtration processes - Theoretical basis and panorama of three types of apparatus. **Ind. Aliment. Agric.** 102(9); 1985; 895-901 (French)

An examination of various agro-food industries (sugar factories, oil mills, beverage and animal products industries, biotechnology) reveals that filtration techniques occupy a prominent place among the unit operations, and involve a very diversified range of apparatuses. The latter have been classified according to the types of mechanism employed in them. The principal laws regulating filtration (flow in the mass, formation of the filter-cake, filtration in depth, surface filtration, clogging) have been indicated. KMD

1933 CANEPA (P), NICCHIA (M) and MARGINETTI (N). Study of the economic feasibility of the process of concentration by ultra-filtration, in the production of protein-rich flour. **Ind. Aliment.** 24(11); 1985; 919-24 (Italian)

A series of tests on the concentration of animal blood were carried out on a pilot-plant scale, using polysulphone membranes for ultra-filtration. A simple thermal concentration process has been compared with a simple membrane filtration process, in respect of energy balance, operating cost, and feeding conditions for the final spray-drying. The membrane filtration process proved to be more economical. KMD

1934 VALENTE (M). Separation of ice and concentrate by continuous pressur in freeze-concentration. **Ind. Aliment. Agric. 102(11)**; 1985; 1179-8 (French)

The method of freeze-concentration reported here makes use of continuous press of the expeller type. An experimental device for the measurement of radial pressure has been developed, in order to record variations of pressure during the treatment of model sucrose solutions (5% and 15%), frozen at -20 C. The pressure variation is cyclic, due to rotation of the screen. The effects of different outlet sections of the press and of different ice cake compositions, on the pressure profile have been studied. The maximum pressure was found to vary in the range 7-38 MPa. KMD

1935 MIETTON-PEUCHOT (M). Tangential filtration in the agro-food industry. **Ind. Aliment. Agric. 102(11)**; 1985; 1185-8 (French)

The principal uses of tangential filtration in the agro-food industries have been reviewed. In enology, this technique can replace centrifugation as a method for the clarification of must. In the case of apple juice, it improves the organoleptic properties of the final product. The final filtration of beer can be quickened by employing this technique. Ultra-filtration is a well-known technique applied to milk; but tangential micro-filtration of the serums does not enable one to recover totally the protein in the filtrate. Ultrafiltration should be used for recovery of protein from the waste water of starch manufacture, or of sunflower isolate production. KMD

1936 PRIES (P). Use of robots in the food industry. **Gordian 85(10)**; 1985; 196,198 (German)

1937 RUBLI (A). Automation in practice - Latest technology for production, transport, and storage in a production unit. **Gordian. 85(10)**; 1985; 199-202 (German)

## ENERGY IN FOOD PROCESING

Nil

## FOOD CHEMISTRY AND ANALYSIS

1938 SURESH CHANDRA (BR), PRAKASH (V) and NARASINGA RAO (MS). Association-dissociation of glycinin in urea, guanidine hydrochloride and sodium dodecyl sulphate solutions. **J. Biosci. 9(3&4)**; 1985; 177-84

1939 VIRK (MS) and ISSENBERG (P). Nitrosation of phenol and 2,6-dimethoxy-phenol and its effect on nitrosamine formation. **J. Agric. Food Chem. 33(6)**; 1985; 1082-5

1940 HACH (CC), BRAYTON (SV) and KOPELOVE (AB). A powerful Kjeldahl nitrogen method using peroxymonosulphuric acid. **J. Agric. Food Chem. 33(6)**; 1986; 1117-23

1941 TRESSL (R), HELAK (B), KOPPLER (H) and REWICKI (D). Formation of 2-(1-pyrrolidinyl)-2-cyclopentenones and cyclopent(b)azepin-8(1H)-ones as proline specific Maillard products. **J. Agric. Food Chem. 33(6)**; 1985; 1132-7

By means of MS, IR, and H NMR spectroscopy eight 2-(1-pyrrolidinyl)-2-cyclopentenones (1-8) and eleven

cyclopent(b)azepin-8(1H)-ones (9-20) were characterized in proline/monosaccharide and proline/cyclic enolone model experiments. The pyrrolidines possess bitter astringent taste and the azepine derivatives bitter taste qualities. Both classes of compounds are formed by a Strecker-type reaction if proline and cyclic enolones. AA

1942 TRESSL (R), GRUNEWALD (KG), KERSTEN (E) and REWICKI (D). Formation of pyrroles and tetrahydroindolizin-6-ones as hydroxyproline-specific Maillard products from glucose and rhamnose. J. Agric. Food Chem. 33(6); 1985; 1137-42

1943 MATSUDA (T), KATO (Y), WATANABE (K) and NAKAMURA (R). Direct evaluation of $\beta$-lactoglobulin lactosylation in early Maillard reaction using an antibody specific to protein-bound lactose. J. Agric. Food Chem. 33(6); 1985; 1193-6

1944 CHANG (Y-I) and REINECCIUS (GA). Isolation and flavour compounds in model systems by countercurrent continuous dialysis. J. Agric. Food Chem. 33(6); 1985; 1168-73

1945 SCHWARTZ (SJ) and PATRONI-KILLAM (M). Detection of cis-trans carotene isomers by two-dimensional thin-layer and high-performance liquid chromatography. J. Agric. Food Chem. 33(6); 1985; 1160-63

1946 EDWARDS (CG) and LEE (CY). Determination of $\beta$-carotene stereoisomers by spectrophotometric analysis. J. Food Sci. 51(2); 1986; 528, 530

1947 BLOSCZYK (G). Examining every-day utensils made of rubber. Part I. HPLC determination of secondary amines. Dtsch. Lebensmittel-Rundschau. 81(10); 1985; 322-5 (German)

The present paper describes an analysing method using high-pressure liquid chromatography, which makes it possible, after a quick derivatisation, to qualitatively and quantitatively determine secondary aliphatic and aromatic amines migrating out of rubber utensils. It uses reversed-phase columns with a phenyl and polymer coated C-18 lining, water/acetonitrile as running agent in the gradient elution, and UV VIS and fluorescence detectors in series connection. AA

1948 GILBERT (J), STARTIN (JR) and CREWS (C). Mass spectrometry and trace analysis of food contaminants. J. Assoc. Publ. Anal. 23(4); 1985; 119-31

Discusses: advantages of mass spectrometry; shortcomings; identification of a previously unknown N-nitrosamine;confirmation of aflatoxin $B_1$ in peanut butter; confirmation of pesticides by GC/MS-multiple ion monitoring; and quantitation of sulphamethazine in animal tissue samples. BSN

## FOOD LAWS AND REGULATIONS

Nil

## FOOD MICROBIOLOGY

1949 LEGOY (MD), KIM (HS) and THOMAS (D). Use of alcohol dehydrogenase for flavour aldehyde production. Process Biochem. 20(4); 1985; 145-8

Vinegar

1950 SCOTTER (MJ) and WOOD (R). Determination of soluble solids in vinegar: collaborative trials. **J. Assoc. Publ. Anal. 23(4); 1985; 107-17**

A collaborative trials by 18 U.K. laboratories has shown that the AOAC method gave better repeatability and reproducibility than the proposed method of the codex coordinating committee for Europe for determination of soluble solids in vinegar. However, the proposed method gave more accurate results and has, therefore, been recommended for adoption by codex coordinating committee. BSN

Protozoa

1951 MUNRO (IG). Protozoa as sources of commercially produced enzymes - A review. **Process Biochem. 20(4); 1985; 139-44**

Discusses: potential of protozoa as enzyme sources; lysosomal enzymes in the protozoa - ciliaphora;enzymes present in rumen ciliate; and culture of protozoa on a large scale. BSN

Yeasts

1952 KARSTENS (W), WESENBERG (J), TROTSCHEL (W) and KONOPKA (G). Corrosion damages at containers of nichrome steel of a yeast cultivation plant. **Lebensmittelindustrie. 32(2); 1985; 82-5 (German)**

## FOOD ADDITIVES

Antimicrobials

1953 MARSHALL (DL) and BULLERMAN (LB). Antimicrobial activity of sucrose fatty acid ester emulsifiers. **J. Food Sci. 51(2); 1986; 468-70**

Six sucrose esters substituted to different degrees with a mixture of fatty acids (palmitic and stearic) were examined for antimicrobial properties. Growth and acid production of several lactic acid bacteria and growth of **Saccharomyces cerevisiae** were not inhibited by 0.2% of the sucrose esters in the test medium. Antimycotic activitywas detected against several mold species from **Aspergillus, Penicillium, Cladosporium,** and **Alternaria**. The least substituted sucrose ester was the most active in reducing mold growth. Reduction of mold growth ranged from 37 to 91% with this ester at a 1% concentration. Inhibitory activity did not appear to be influenced by changes in pH. Aflatoxin production by **Aspergillus parasiticus** was not affected by presence of 0.1% sucrose ester. AA

## CEREALS

1954 Cereal Research Working Group. Report on the 36th Convention on Cereal Chemistry, Detmold, 29-30 May 1985. **Dtsch. Lebensmitted-Rundsch. 81(10); 1985; 329-33 (German)**

Summaries of the following 19 papers have been reproduced here. MEUSER (F) and SUCKOW (P) - Chemico-physical characterization and baking-technological effect of rye pentosans. SEIBEL (W) and STEPHAN (H) - Standarization of baking test with whole-grain meals. THOMAS (B) - Limitations placed by dietary fibre on the palatibility of cereals. BENEDICKT (G) - The carry-over principle in the labelling of additives containing adjuncts. BECKER (G) - Guidelines for bread and small baked goods. BRUMMER (JM) - Trade names for small baked goods. SEIBEL (W) - sour dough, viewed from the legal standpoint. STEINMETZ (R) - On the

nomenclature "bio"- or "alternative". DRESSELHAUS-SCHRDEBLER (M) - Determination and calculation of egg content in baked goods. RABE (E) - Estimation of dietary fibre, according to 35 LMBG (German Food Law). STREIT (H) - On the detection and evaluation of colouration of bread and rolls. OCKER (HD) - Residues of plant treatment agents in cereal products. KUHN (MC) and GROSCH (W) - Researches on the fractionation and reconstitution of rye flour. GROSCH (W) and SCHIEBERLE (P) - Evaluation of bread by determination of volatile aroma compounds. BOLLING (H) - NIR measurement technique - Methodology and possibilities of application in cereal technology. RABE (E) - Methods for the estimation of fibre content in milled cereal products and baked goods. ELBAYA (AW), FRETZDORF (B) and MUNZING (K) - Behaviour of lipids during storage of wheat in a controlled atmosphere. NIERLE (W) and ELBAYA (AW) - On the action of lipid-protein complexes on the baking behaviour of wheats. KMD

1955 PATEL (AR), PATEL (MR), SUTHAR (JN), PATEL (KC) and PATEL (RD). Morphology of cereal starches grafted with polyacrylonitrile. **Starch. 37**(10); 1985; 336-42

1956 HENRY (RJ). A comparison of the non-starch carbohydrates in cereal grains. **J. Sci. Food Agric. 36**(12); 1985; 1243-53

The carbohydrates soluble in 80% ethanol and in water at 100 C were extracted from two varieties of wheat, barley, oats, rye, triticale, rice and malt. The highest concentrations of sugars soluble in 80% ethanol were found in malt and rye with the lowest in rice. Barley contained the most raffinose and rye contained the most fructan. Rye had the highest levels of water-soluble and total (1→3), (1→4)-β-glucans. The total arabinose:xylose ratio varied from 1.2 in wheat and triticale to 0.3 in oats. All were very low in uronic acids. AA

1957 THOMAS (B). Restrictions in palatability of cereal dietary fibre. **Getreide Mehl Brot. 39**(9); 1985; 282-5 (German)

Digestive systems which have become accustomed to a low-fibre diet cannot immediately handle a high-fibre diet, as their tissues have become too weak, and the intestinal flora are not of the type best suited for the high-fibre diet. The system requires time to get accustomed to the new conditions, and older persons would require more time than younger persons. KMD

1958 RANGASWAMY (JR). Phosphine residue and its desorption from cereals. **J. Agric. Food Chem. 33**(6); 1985; 1102-6

The extent and the pattern of desorption of $PH_3$ residue in wheat, raw polished rice, raw unpolished rice, and parboiled rice were followed at laboratory level for 60 days. The $pH_3$ residue on each day of storage was computed by knowing the total amount of $PH_3$ desorbed over 60 days. The $pH_3$ desorption patterns from four types of cereals are discussed under three stages: up to 19 days, 20-49 days, and 50-60 days of storage. The relationship between the logarithm of such residues vs. storage in days is linear over the first 19 days, except in the case of residue from raw polished rice, which is only up to the first 9 days. During the period of linearity the desorption follows first-order kinetics. Between days 20 and 49 there is a waxing and waning in the amount of $pH_3$ desorbed. Between days 50 and 60 there is a regular fall in $pH_3$ residues due to uniform decreased desorption, except in raw unpolished rice in which desorption is a bit sluggish up to 56 days. AA

1959 TOURLIERE (S). Ethanol from straw-bearing cereals - technological choice. **Ind. Aliment. Agric. 102**(11); 1985; 1189-93 (French)

The author has presented a historical review of the production

of alcohol (ethanol) from cereals in France, going back as far as 1853. He has described, in detail,the latest AMYLD process which is based on an earlier process - developed by Dr. Calmette in 1875 - of saccharification and alcoholic fermentation by means of a Mucor strain, viz. **Amylomyces Rouxii**. KMD

Rice

1960 SHIN (MG), YOON (SH), RHEE (JS) and KWON (T-W). Correlation between oxidative deterioration of unsaturated lipid and n-hexanal during storage of brown rice. **J. Food Sci.** 51(2); 1986; 460-63

n-Hexanal in the headspace over cooked brown rice stored at 5 C and 35 C for 0, 4, 8 and 12 months was determined by a gas chromatographic method using modified direct vapour injection. The off-flavours of stored brown rice were evaluated by n-hexanal was found to be linearly proportional to the amount of oxidized linoleic acid (correlation coefficient, 0.99). Therefore, the simple and rapid method of vapour injection gas chromatography can be used for determining n-hexanal in the headspace vapour over cooked brown rice. Thus, the off-flavour of the stored brown rice resulting from lipid oxidation can be detected indirectly. AA

1961 CHANG (KC), LEE (CC) and BROWN (G). Production and nutritional evaluation of high-protein rice flour. **J. Food Sci.** 51(2); 1986; 464-7

Optimal processing conditions for the production of high-protein rice flour from two rice varieties were determined. Gelatinized rice flour slurry was treated with 0.25 mg $\alpha$-amylase per milliliter of slurry at 60 C for 90 minutes. The hydrolyzed starch was removed by centrifugation. The precipitated paste was then freeze-dried to yield high-protein rice flour which had 38% protein. The amino acid composition of the high-protein rice flour was similar to that of the dehulled rice flour. The protein efficiency ratio of the high-protein rice flour was 2.17. Supplementation with limiting amino acids, lysine and threonine, or with a laboratory-prepared freeze-dried soy isolate increased protein efficiency ratios above that of casein. AA

1962 HODGES (RJ), HALID (H), REES (DP), MEIK (J) and SARJONO (J). Insect traps tested as an aid to pest management in milled rice stores. **J. Stored Prod. Res.** 21(4); 1985; 215-29

Triticales

1963 WEIPERT (D). Characteristics and possibilities of utilization of Triticale. **Getreide Mehl Brot.** 39(10); 1985; 291-8 (German)

Triticale does possess the advantage of having a high content of protein of good biological value; but, because of anomalies in its grain structure and high enzyme activity, it gives rise to technological difficulties during milling and baking. Appropriate procedures and recipes for the manufacture of bread from triticale have not yet been evolved. That is why triticale is being used mainly for animal feeding. Despite these disadvantages, triticale remains an interesting and very promising type of cereal, whose full genetic and technological properties have not yet been exhausted. KMD

Wheat

1964 BERTRAND (D), ROBERT (P) and LOISEL (W). Identification of some wheat varieties by near infrared reflectance spectroscopy. **J. Sci. Food Agric.** 36(11); 1985; 1120-24

Two hundred and two wheat samples including 66 samples of six known varieties were collected and their near infrared spectra was

recorded. Spectral data, were mathematically corrected in order to reduce the effect of granularity on NIR spectra, then principal component and analysis and multiple discriminant analysis (MDA) were applied to the corrected data. MDA allowed and efficient identification of the genetic origin of unknown samples; on a prediction set, 87% of samples were correctly identified. The computerised identification procedure needed less than 20 records for one sample. KAR

1965 ZIDERMAN (II) and FRIEDMAN (M). Thermal and compositional changes of dry wheat gluten-carbohydrate mixtures during simulated crust baking. **J. Agric. Food Chem. 33**(6); 1985; 1096-102

A model system was designed to simulate crust baking at 215 C for 72 minutes. The effect of admixtures of food carbohydrates on compositional changes and thermal stability of wheat gluten was investigated. Exothermic browning was accompanied by volatilization and nonuniform depletion of aminoacids. Three transformations could be discerned: above 161 C (internal temperature measured with a thermocouple), volatilization of nonnitrogenous compounds;about 189 C, volatilization of nitrogenous products; about 235 C, conversion of amino acid residues to nonvolatile nitrogenous products. The latter was the main overall fate of the protein. Above 300 C, however, volatilization was the predominant change. Thermal reactivity of gluten-carbohydrate mixtures increased in the following order: L-ascorbic acid < potato amylose≃wheat starch cellulose ethers ≃ glucose ≃ fructose ≃ lactose maltose < sucrose < cellulose. The possible implications of these findings for the mechanism of browning and for baked foods are also discussed. AA

1966 DOEKES (GJ). Connections between electric protein charges and kernel hardness in wheat. **Getreide Mehl Brot. 39**(9); 1985; 259-63 (German)

1967 BOWLER (P), TOWERSEY (PJ) and GALLIARD (T). Some effects of the minor components of wheat starch on glucose syrup production. **Starch. 37**(10); 1985; 351-6

In this paper,we illustrate the importance of the minor components found in wheat starch preparations,and give details of the techniques, used for their selective removal in the laboratory: some of these techniques have potential for industrial application. Procedures for syrup production from these selectively extracted starches are described, together with an assessment of the effects of the minor components on both process and product characteristics. Although both wheat and maize starches contain similar levels of minor components, the effects and fate of these during syrup production differed. However, it was found that with suitable pretreatments to wheat starch, syrups of similar process and product characteristics may be obtained from wheat and maize starches. AA

1968 DREYER (E), SEIBEL (W) and JAHN-DEESBACH (W). Milling experiments for optimization of baking behaviour of whole wheat kernel meal and flour. **Getreide Mehl Brot. 39**(10); 1985; 298-301 (German)

The method of milling used in the baking test for whole-meal bread has a marked influence on the volume yield of the test loaf. A fine meal obtained with a hammer mill showed a volume yield of only 330 ml; an extra fine meal obtained with the same grain material showed a volume yield of approximately 400 ml and could be used for whole-meal breads without any trouble. In contrast, a whole-wheat meal obtained with a roller mill (as used in the Rapid-Mix test) exhibited a volume yield of 620 ml. Thus, whole-wheat meal produced in a roller mill is best suited for the production of whole-meal breads having a loose crumb structure. KMD

1969 KAMEL (BS). Fermented whole wheat flour and whey in food preparation. Process. Biochem. 20(6); 1985; 190-93

The possibility of producing fermented products utilizing whole wheat, with or without the addition of whey, by pure or mixed cultures under controlled conditions was investigated as a means to the improvement of a traditional Middle Eastern food (kishuk). Cultures of Streptococcus lactis, Saccharomyces rouxii, and Saccharomyces fragilis were used at 32 C for 24 hours. The acid development was satisfactory in all cases; the final products had a pH range of 3.7-5.3. The addition of whey to the whole wheat did not appear to change the course of the fermentation process significantly. The final fermented product had a pleasant sour taste and flavour and can be dried to powder form, which could be easily reconstituted in water to give a pleasant tasting sour porridge. The protein content of the final dry products was approximately 23%. AA

## MILLETS

### Maize

1970 CHINACHOTI (P) and STEINBERG (MP). Crystallinity of sucrose by X-ray diffraction as influenced by absorption versus desorption, waxy maize starch content, and water activity. J. Food Sci. 51(2); 1986; 456-9, 463

Crystallinity of sucrose in a mixture with waxy maize starch as affected by absorption and desorption in the range 0.33 to 0.97 $a_w$ was studied by X-ray diffraction. Ratio of sucrose to starch peak areas was linear with weight ratios as expected. Sucrose crystallinity as determined by X-ray diffraction was found to be in excellent agreement with that calculated from sorption data. Sucrose in a mixture equilibrated by absorption to 0.33 and 0.75 $a_w$ was about 80% crystalline. On absorption to 0.84 $a_w$, the mixture showed sucrose crystallinity reduced to 50%. However, on desorption to 0.33-0.84 $a_w$, the sucrose crystallinity was reduced to zero regardless of sucrose content. AA

1971 McCULLOUGH (MAP), JOHNSON (JM) and PHILLIPS (JA). High fructose corn syrup replacement for sucrose in shortened cakes. J. Food Sci. 51(2); 1986; 536-7

### Sorghum

1972 CAGAMPANG (GB), CREEK (B) and KIRLEIS (AW). Properties of starches isolated from sorghum floury and corneous endosperm. Starch. 37(8); 1985; 253-7

Decorticated grains of three sorghum cultivars of intermediate grain hardness were individually dissected to separate the floury and the corneous endosperm fractions. The starch and polymeric components (amylose and amylopectin) of each of the endosperm fractions were isolated and subsequently characterized. Results indicate that there exist major differences in the properties (granule size distribution, gelatinization temperature, iodine binding capacity, and rate of lintnerization) of the starch and starch components from the endosperm fractions. Close relationships between starch properties and the strength of the alkali gel of the corresponding endosperm fraction were observed. AA

1973 SHAZALI (MEH) and SMITH (RH). Life history studies of internally feeding pests of stored sorghum: Sitotroga cerealella (Ol). and Sitophilus oryzae (L.). J. Stored Prod. Res. 21(4); 1985; 171-8

A laboratory study of the ecology of single species populations

of **Sitotroga cerealella** (Olivier) and **Sitophilus oryzae** (L.) was made at 3 temperatures (25, 30 and 35 C) and 3 relative humidities (60, 70 and 80% r.h.). The effects of 2 lower humdities (40 and 50% r.h.) on both species were also studied at 30 C. The optimum conditions for multiplication of **S. cerealella** were found to be 25-30 C and 60-80% r.h. while for **S. oryzae** the optimum was more clearly defined (30 C and 80% r.h.). However **S. cerealella** could tolerate a higher temperature (35 C) and lower humidities (40 and 50% r.h. at 30 C) than **S. oryzae**. The results are compared with those of other workers on sorghum and other cereals, and discussed in relation to the distribution of the two species in Sudan. AA

## PULSES

1974 SOSULSKI (FW), HOOVER (R), TYLER (RT), SASKATOON and MURRAY (ED). Differential scanning calorimetry of air-classified starch and protein fractions from eight legume species. **Starch. 37**(3); 1985; 257-62

The thermodynamic parameters of eight legume flours were interpreted following differential scanning calorimetry (DSC) of their air-classified starch and protein fractions. Samples of legumes from different sources, and their air-classified fractions, showed consistent peak gelatinization (TG) and peak denaturation aggregation temperatures for each legume species. However, enthalpies of gelatinization and denaturation/aggregation were highly variable,were not specific to species, and appeared to be determined primarily by environmental conditions during seed development. The TG values for the starch fractions were closely correlated to the initial pasting temperatures but the viscosity characteristics of the starch slurries were not associated with DSC parameters or the amylose contents of the starch fractions. The amylograph viscosity curves lacked a distinct pasting peak and showed stable viscosities during the heating cycle. AA

1975 JOGINADHA SWAMY (M), VENKATA KRISHNA SASTRY (M) and SUROLIA (A). Prediction and comparison of the secondary structure of legume lectins. **J. Biosci. 9**(3&4); 1985; 203-12

### Cowpeas

1976 KOEHLER (PE), BEUCHAT (LR) and CHHINNAN (MS). Influence of temperature and water activity on aflatoxin production by **Aspergillus flavus** in cowpea (**Vigna unguiculata**) seeds and meal. **J. Food Prot. 48**(12); 1985; 1040-43

It has been shown that cowpeas subjected to temperatures of 21, 30 and 37 C and $a_w$ of 0.76 to 0.98 support growth and subsequent aflatoxin production by **A. flavus**. Though the levels of aflatoxin production on cowpeas may not be as great as on peanuts or corn subjected to same temperture and $a_w$ conditions, the potential for human health hazards associated with improperly stored and processed cowpeas exists and must be considered in overall handling systems followed in inudstry and in the home. MVG

### Fababeans

1977 ARNTFIELD (SD), MURRAY (ED) and ISMOND (MAH). Effect of salt on the thermal stability of storage proteins from fababean (**Vicia faba**). **J. Food Sci. 51**(2); 1986; 371-7

The influence of various salts on the stability of proteins in a fababean isolate were examined using differential scanning calorimetry (DSC) to monitor denaturation temperature (Td). The ability of some

salts to increase Td values, or stabilize the protein, was described as a biphasic linear relationship. The two distinct phases were attributed to two established stabilization mechanisms, electrostatic interaction and preferential hydration. Ranking of salts in terms of ability to stabilize or destabilize fababean proteins followed the lyotropic series for both major structural proteins present in the isolate. In most salt environments, responses of the two proteins, legumin and vicilin, were slightly different; these differences were attributed to differences in electrostatic profiles and response to water availability for the two proteins. AA

1978 ZAYED (SMAD) and FARGHALY (M). Distribution and degradation of tetrachlorvinphos on stored faba beans and soybeans. **J. Stored Prod. Res.** 21(4); 1985; 199-205

The distribution and degradation of $^{(CH_3-^{14}C)}$ tetrachlorvinphos in stored faba beans and soya beans were studied for 30 weeks at moisture contents and temperatures similar to those prevailing under normal storage conditions. Tetrachlorvinphos penetrated the seed coat and the insecticide residues inside the beans increased with storage time. A considerable protein of radioactivity, amounting to about 20-30% of the applied dose in faba beans and 30-40% in soybeans, was present in a non-extractable form. Residues on the seed coat consisted mainly of unchanged insecticide. The internal extract contained both unchanged insecticide and desmethyltetrachlorvinphos which was present in a free and a conjugated form. Dimethyl phosphate and monomethyl phosphate were identified as hydrophilic $^{14}C$-degradation products. The degradation of tetrachlorvinphos proceeded mainly via cleavage of methoxy groups.The nature and percentage of metabolites varied slightly with storage period. A scheme for possible degradation routes of tetrachlorvinphos on stored beans is suggested. AA

Mungbeans

1979 BARROGA (CF), LAURENA (AC) and MENDOZA (EMT). Effect of condensed tannins on the in vitro protein digestibility of mung bean (**Vigna radiata** (L.) Wilczek). J. Agric. Food Chem. 33(6); 1985; 1157-9

Snapbeans

1980 RAO (MA), COOLEY (HJ) and VITALI (AA). Thermal energy consumption for blanching and sterilization of snap beans. **J. Food Sci.** 51(2); 1986; 378-80

Steam consumption for a water blancher and a continuous pressure sterilizer (CPS) was measured in a snap bean cannery. For the blancher it ranged between 0.204 and 0.306 lb/lb of beans. The energy efficiency of the blancher was found to be between 26.3-52.3%. In a pilot scale test, the concentration of Ca, Mg, and K ions increased as the blanching water was recycled and the firmness of the beans after canning varied between 0.855 and 1.010 kN. Steam consumption by the CPS was related linearly to the loading rate of cans: steam consumed (lb/hr) = 1075.9 + 0.073 x (cans/hour). AA

## OILSEEDS AND NUTS

Cottonseeds

1981 ELZEN (GW), WILLIAMS (HJ), BELL (AA), STIPANOVIC (RD) and VINSON (SB). Quantification of volatile terpenes of glanded and glandless **Gossypium hirsutum** L. cultivars and lines by gas chromatography. J. Agric. Food Chem. 33(6); 1986; 1079-82

Groundnuts

1982 SHOKRAII (EH), ESEN (A) and MOZINGO (RW). Relation of a 36 000-dalton arachin subunit to blanchability in peanuts (**Arachis hypogaea** L.). **J. Agric. Food Chem. 33**(6); 1985; 1114-6

Seed proteins from 22 different peanut cultivars were analyzed by SDS-polyacrylamide gel electrophoresis (SDS-PAGE) and isoelectric focusing (IEF). The comparison of electrophoretic profiles revealed the presence of a 36K dalton, major polypeptide in most of the cultivars and breeding lines with poor blanchability, those whose seed coat adheres to the cotyledon tightly. It is not known whether or not this polypeptide is directly responsible for the poor blanchability of these cultivars and lines. However, this character, namely presence vs. absence of the 36K polypeptide, could be used as a reliable indicator of blanchability in peanut cultivars and breeding lines. It may also serve as an important criterion in the assessment of the quality of peanuts for processing purposes. AA

1983 CHIOU (RY-Y), BEUCHAT (LR) and PHILLIPS (RD). Functional and physical property characterization of peanut milk proteins partially hydrolyzed by immobilized papain in a continuous reactor. **J. Agric. Food Chem. 33**(6); 1985; 1109-13

A laboratory-scale reactor was designed in which immobilized papain was used to continuously hydrolyze peanut flour milk (PFM) at 52 C and pH 7.2 for 10 hours of operation time. The reaction volume was 150 mL, and the flow rate was 100 mL/hour. Enzyme activity was maintained for 6 hours under continuous purging with nitrogen and then decreased with time. A reduction in molecular weight of proteins in PFM was observed by subjecting samples to gel electrophoresis and gel filtration chromatography. The hydrolyzed peanut flour milk (HPFM) had improved nitrogen solubility at pH 4.5-7.0 and thermal stability at pH 5.0. The emulsion capacity of HPFM was slightly less than that of PFM. Freeze-dried HPFM incorporated (1%, w/v) into grape and apple juices resulted in nitrogen solubilities of 59.6 and 65.4%, respectively. AA

Linseed

1984 MADHUSUDHAN (KT) and SINGH (N). Effect of detoxification treatment on the physicochemical properties of linseed proteins. **J. Agric. Food Chem. 33**(6); 1985; 1219-22

The physicochemical properties and **in vitro** digestibility of proteins of raw and detoxified linseed meal were compared. There was a 30% decrease in available lysine content and a 38% increase in **in vitro** digestibility. There was no significant change in the amino acid composition on detoxification. The high molecular weight protein from the detoxified meal was dissociated. AA

1985 MADHUSUDHAN (KT) and NARENDRA SINGH. Effect of heat treatment on the functional properties of linseed meal. **J. Agric. Food Chem. 33**(6); 1985; 1222-6

Nitrogen solubility, fat and water absorption capacity, bulk density, foam capacity and stability, and emulsification capacity of raw linseed meal (LM) and water-boiled linseed meal (WB) were determined and compared with those of defatted soybean meal (SM). Water boiling reduced the nitrogen solubility of linseed meal in water, NaCl, and sodium hexametaphosphate. The water absorption capacity of LM was 345 g compared to 443 g of WB, whereas the fat absorption capacity of LM and WB was 236 and 167 g/100 g of flour, respectively. On the other hand, SM exhibited lower water (305 g) and fat absorption (167 g) than LM. SM showed higher foam capacity and emulsification capacity than LM. The foam stability of LM was better than that of

SM. Heat processing diminished the foam capacity and stability and emulsification capacity of linseed meal. AA

Rapeseed

1986 MARQUARD (R) and SCHLESINGER (V). Methodical investigations of glucosinolate determination of rapeseed. **Fette Seifen Anstrichm. 87**(12); 1985; 471-6 (German)

The decrease of the glucosinolate content, due to cultivation, causes analytical problems, because the GSL samples is significantly altered in dependence on the total GSL content. Comparative analyses, obtained by isothermic gas chromatography and HPLC show that the share of the indolyl-glucosinolates can increase up to 30-40%, if the total GSL content is diminished to about 3%. Besides the mentioned methods of HPLC and GC, photometric procedures were examined with respect to their suitability to determine the total GSL content in rapeseed. AA

Sesame

1987 PRAKASH (V). Hydrodynamic properties of $\beta$-globulin from **Sesamum indicum** L. **J. Biosci. 9**(3&4); 1985; 165-75

Soybeans

1988 WEBER (N), WIECHEN (A), BUCHHEIM (W) and PROKOPEK (D). Alterations of soybean lecithin during curd formation in cheese making. **J. Agric. Food Chem. 33**(6); 1985; 1093-6

Radioactive phosphatidylcholine and phosphatidyletholamineswere used to study the alterations of soybean lecithins during curd formation. Results showed that most of the added mixture of radioactive glycerophospholipids was not changed during processing of milk. Minor proportion of these labelled compounds were metabolised by starch and penicillium cultures. Radioactive lipophilic hydrolysis products and hydrophilic metabolites of microbial derived from added labelled glycerophospholipids were concentrated predominantly in whey. MVG

1989 HAGAN (RC), DAHL (SR) and VILLOTA (R). Texturization of co-precipitated soybean and peanut proteins by twin-screw extrusion. **J. Food Sci. 51**(2); 1986; 367-70

A co-precipitated concentrate of soybean and peanut proteins, prepared from flours along with two soy concentrates, a peanut concentrate and a soy-peanut concentrate blend, were texturized by twin-screw extrusion followed by rheological, functional and ultrastructural analysis of the textured products. Optimal feed moisture varied among the different feed materials and correspondeo to final product moisture. Compared to the other textured products, the textured co-precipitated concentrate exhibited increased rehydration capacity, decreased peak force and work, moderate expansion and a unique ultrastructure. Product ultrastructure was determined to correspond with rheological and functional characteristics of the extrudates. Co-precipitation of soybean and peanut proteins resulted in a feed material with modified extrusion performance. AA

1990 BROOKS (JR) and MORR (CV). Effect of phytate removal treatments upon the molecular weight and subunit composition of major soy protein fractions. **J. Agric. Food Chem. 33**(6); 1985; 1128-32

Changes in soy protein molecular weight profile and subunit composition of major Sepharose gel filtration proteinfractions of soy extract resulting from treatment by the alkaline pH and ion exchange processes to remove phytate are studied. The alkaline pH phytate removal treatment removed only 62% of the total phosphorous content of soy extract, but caused major amounts of aggregation, glycinin and -

conglycinin-containing Sepharose protein fractions. On the other hand, ion exchange treatment removed 82% of total phosphorous contact and caused only minor alteration in the molecular weight profile and subunit composition of Sepharose protein fraction. The approach could be used to evaluate the effects of different processing treatments upon the physicochemical properties of major soy protein components. MVG

1991 NAKAMURA (T), UTSUMI (S) and MORI (T). Effects of temperature on the different stages in thermal gelling of glycinin. **J. Agric. Food Chem. 33(6); 1985; 1201-3**

The thermal gelation of soybean 11S globulin (glycinin) proceeds at 100 C, pH 7.6, and ionic strength 0.5 through the two stages, i.e., the association of glycinin molecules to form soluble aggregates in the form of strands (stage 1) followed by interaction of the strands to form the gel network (stage 2). When the effects of heating temperature on the progress of each stage in the gelling process were examined, it was revealed that 100 C was required for the stage 1, but not for stage 2. When stage 1 had proceeded sufficiently at 100 C, stage 2 proceeded by subsequent heating even at 80 C. The two stages in thermal gelling of glycinin were revealed to be different and characterized with regard to the requirement of heating temperaure. Thus, it is not necessary to maintain the temperature at 100 C from the beginning to the end of the process to make gels of glycinin. AA

1992 PASTER (N) and CALDERON (M). Moisture sorption by soybeans and soybean dockage and its implication in bulk-storage of soybeans. **Trop. Sci. 25(4); 1985; 235-8**

Soybean dockage was faster in absorbing water from the ambient atmosphere and reached a higher equilibrium moisture content value than sound soybeans. BSN

1993 BEN-EFRAIM (A), LISKER (N) and HENIS (Y). Spontaneous heating and the damage it causes to commercially stored soybeans in Israel. **J. Stored Prod. Res. 21(4); 1985; 179-87**

Spontaneous heating occurred in stored soybeans in Israel after only a few months of storage. In bins were spontaneous heating (to about 40 C)was detected early, soybean moisture content (m.c.) started to increase from the original 12-13% to 13.3-13.9% at the 2 m depth level and the free fatty acids (FFA) level, mould counts, respiration remained at levels acceptable for commercially stored soybeans. Aeration of the bins caused a decrease in temperature at the 2 m depth leveland equalised the temperature of the whole bulk. In one case,where initial heating was not detected early enough, a 30-50 tonne core of a total of 2000 tonnes burned, the core being located in the upper portion of the buulk. At the core of the heat-damaged soybeans. FFA level increased to more than 35%, while at the outer edge of the core FFA content was 22-24%. Because of the high temperature developed (up to 98 C),no fungi could be isolated from the heat-damaged soybeans. A greater amount of dockage and split soybean seeds was found in the heat-damaged core. Intact soybeans around the heat-damaged bulk were not affected. In small soybean conglomerates found in the bin during the unloading process, the FFA content had increased to about 12% and mould count to about $10^6$ propagules/g. **Aspergillus flavus** was the only fungus isolated in all samples examined from this silo. In silos where aeration and refrigeration operations were performed periodically, seed temperature was kept low, permitting prolonged storage of soybeans. After almost 4 years storage, the FFA content of the soybeans was about 1% and fungal counts did not exceed $10^2$ propagules/g. AA

## TUBERS AND VEGETABLES

### Carrots

1994 EDWARDS (CG) and LEE (CY). Measurement of provitamin A carotenoids in fresh and canned carrots and green peas. **J. Food Sci.** 51(2); 1986; 534-5

The influence of thermal processing (canning) on the carotenoid content of carrots (**Daucus carota**) and green peas (**Pisum sativum**) was investigated. Carotenoids extracted from fresh and canned vegetables were separated by column chromatography and quantified using spectrophotometric analysis. Canned carrots and green peas had a higher carotenoid content than fresh samples. The apparent increase in canned carrots was mainly due to the loss of soluble solids into the brine during processing. However, the increase of carotenoids in canned green peas was due to the loss of carotenoids by enzymatic activity in fresh green peas during extraction procedures. AA

### Cassava

1995 NAMBISAN (B) and SUNDARESAN (S). Effect of processing on the cyanoglucoside content of cassava. **J. Sci. Food Agric.** 36(11); 1985; 1197-203

Baked, fried and streamed tubers retained maximum (> 80%) cyanoglucoside (CNG). In sun-dried chips, retention varied from 30-60% depending upon chip thickness. In case of cassava boiled in water, smaller chip size and sufficient water was found to be the ideal condition for maximum CNG removal.The most ideal effective method of CNG removal was by crushing fresh tuber and subsequent sun-drying whereby >95% CNG was eliminated. KAR

1996 MOORTHY (SN). Effect of different types of surfactants on cassava starch properties. **J. Agric. Food Chem.** 33(6); 1985; 1227-32

The effect of anionic, neutral, and cationic surfactants in three different concentrations on cassava starch properties was studied. The iodine affinity of total amylose was reduced by 20-40% by all surfactants, with highest reduction being observed for cetyltrimethylammonium bromide. The iodine affinity of soluble amylose was suppressed by 30-70% by all reagents except cetyltrimethylammonium bromide, which lowered the value to almost zero. There was no significant difference between the concentrations 0.04 and 0.06 mol of surfactant per 100 g of starch. Viscosity was stabilized by potassium stearate and potassium palmitate without greatly affecting the peak viscosity of 660 BU of pure starch, but sodium lauryl sulphate and cetyltrimethylamonium bromide increased the peak viscosity to 900 and 780 BU, respectively, at 0.06-mol concentration and did not show stable viscosity during the holding period. Defatted and raw starch showed similar viscosity patterns on incorporation of surfactants. Pasting temperature was increased to over 90 C by potassium strearate, palmitate, and glyceryl monostearate, while the increase was only by 3-15 C over control (65 C) by the other two reagents. The swelling volume of starch was reduced to nearly half the original value by potassium palmitate and stearate, while glyceryl monostearate did not change it noticeably. Sodium lauryl sulphate and cetyltrimethylammonium bromide increased the value by nearly 50%. Solution stability was improved considerably by all the reagents. The results are discussed in relation to structure of the surfactants. AA

Potatoes

1997 MONDY (NI) and LEJA (M). Effect of mechanical injury on the ascorbic acid content of potatoes. **J. Food Sci.** 51(2); 1986; 355-7

Effects of two types of mechanical injury (wounding and bruising) on the ascorbic acid content of Belrus cultivar tubers were compared. Wounding involved cutting slices (1 mm) and strips (10 x 20 mm) and both slices and strips exhibited a highly significant increase ($p < 0.01$) in ascorbic acid following wounding. The largest increase (400%) occurred in slices after 2 days. Ascorbic acid decreased significantly ($p < 0.05$) in the bruised halves as compared with the unbruised halves. Maximum decrease in ascorbic acid (347%) of bruised tissue occurred ater 2 days storage at 5 C. The unbruised halves appeared to synthesize ascorbic acid when compared with the controls,the maximum increase (144%) occurring after 2 days storage at 5 C. AA

1998 MONDY (NI) and PONNAMPALAM (R). Potato quality as affected by source of magnesium fertilizer: Nitrogen, minerals, and ascorbic acid. J. **Food Sci. 51(2)**; 1986; 352-4

Two sources of magnesium fertilizer, Epsom salt and dolomite, were compared as to their effect on nitrogen, mineral, and ascorbic acid contents of Katahdin potatoes. Both Mg sources increased significantly ($p < 0.05$) the total, nonprotein, and protein nitrogen of both cortex and pith tissues. The pith tissue was significantly ($p < 0.05$) higher than the cortex in total and nonprotein nitrogen. Potatoes fertilized with Epsom salt were higher in nitrogen than those receiving dolomite. Both sources of Mg significantly ($p < 0.05$) increased Al and Fe contents of tubers, and the greater increase occurred with Epsom salt. Tubers from soils receiving dolomite were significantly ($p < 0.05$) higher in manganese and cadmium contents than those receiving Epsom salt. No significant differences were observed in ascorbic acid content with either Mg source. AA

1999 GOLACHOWSKI (A). Properties of starch obtained from potato tubers influenced by various temperatures. **Starch.** 37(8); 1985; 263-6

The properties of starch separated from potato tubers were studied regarding the following storage temperature: + 20 C, + 8 C, + 4 C and 0 C. The study included also potato tubers having been frozen, thawed and refrozen as well as potato tubers before storage. Starch separated from the stored potato tubers showed differences in chemical composition, reducing power, granularity, whiteness and viscosity as well as gelatinization temperatures in comparison with the starch separated from potato tubers before storage. Quantity and direction of the changes within starch properties depended on storage temperatures. The smallest changes in the properties were observed during potato storage at +4 C and +8 C. AA

2000 LELIEVRE (J). Gelatinization of crosslinked potato starch. **Starch.** 37(8); 1985; 267-9

The gelatinization temperature of crosslinked potato starch suspended in water was measured as a function of the water content of the sample. The resultant data were analysed using the thermodynamic theory of melting in polymer diluent systems. The dependence of the values of the thermodynamic parameters so obtained on the procedure used to analyse the data is discussed. Differences between gelatinization and melting transitions in synthetic polymerorganic diluent mixtures are considered. AA

2001 LESZCZYNSKI (W) and LISINSKA (G). Effect of herbicides on chemical composition of potato tubers and quality of the subsequent chips and starch. **Starch. 37(10)**; 1985; 329-34

Application of 6 different herbicides in potato cultivation resulted in changes of chemical composition of tubers, quality of chips and properties of starch, Sencor, Bladex, Topogard, Aflaon and Aresin indicated rather unfavourable effects on chemical composition of the tubers. On one hand, they increased the average weight of the tubers, on the other hand they decreased the dry matter (triazines) and starch content (Afalon). They increased the amount of reducing and total sugars (urea) and increased the content of amide nitrogen (triazines and Afalon) and amino acid nitrogen (Bladex). Sencor and Aflaon resulted in darker colour of the chips. Afalon, Aresin and Chwastex increased the part of small granules or decreased the amount of large granules in the starch. Afalon and Bladex resulted in changes of phosphorus content and Chwastox changed the amount of amylose in starch. AA

Sweet potatoes

2002 TAMATE (J) and BRADBURY (JH). Determination of sugars in tropical root crops using $^{13}C$ NMR spectroscopy: Comparison with the HPLC method. **J. Sci. Food Agric. 36**(12); 1985; 1291-302.

Samples of sweet potato and taro flour dried at 40 C, were blended with 80% ethanol, the sugars were extracted and analysed by $13_C$ NMR and hplc. Both methods gave similar results and have similar degrees of reproducibility. The NMR methods is useful for quantitation of sugars and identification of other molecules extracted from the food require more material than hplc. KAR

2003 LU (JY), BISWAS (PK) and PACE (RD). Effect of elevated $CO_2$ growth conditions on the nutritive composition and acceptability of baked sweet potatoes. **J. Food Sci. 51**(2); 1986; 358-9, 539

Elevated $CO_2$ concentrations (354, 431, 506 and 659 ppm for 90 days) decreased protein, total carotenoids and insoluble dietary factors. Dry matter increased and a reddish-orange colour was observed at 506 and 659 ppm $CO_2$ concentration. Sensory flavour and moistness scores of sweet potatoes under high $CO_2$ concentrations were acceptable and did not differ from controls. MVG

2004 SZYPERSKI (RJ), HAMANN (DD) and WALTER (WM) Jr. Controlled alpha amylase process for improved sweet potato puree. J. **Food Sci. 51**(2); 1986; 360-63, 377

The process for producing sweet potato puree independent of age or seasonal variations of raw roots, includes thermal gelatinisation of puree starch, enzyme hydrolysis of a portion of the puree and subsequent blending of enzyme-treated and untreated portions. Alcohol insoluble solids decreased as the percentage of enzyme-treated puree in the mixture was increased. When the proportion of enzyme-treated puree was greater than 75 %, chemical and rheological differences in purees made from fresh and stored roots became insignificant. With greater than 50 % proportion of enzyme-treated puree, sensory differences were insignificant. MVG

2005 McARDLE (RN) and BOUWKAMP (JC). Use of heat treatments for saccharification of sweet potato mashes. J. **Food Sci. 51**(2); 1986; 364-6

Aqueous sweet potato slurries (mashes) were heated in an open, steam jacketed kettle. Soluble solids increased with temperature increase upto 80 C. Extended heating after initial temperature increase did not increase soluble solids, possibly because of the nature of the heating process or enzyme activity. Extended holding treatments did not affect sugar levels but increase in temperature from 50 to 80 C resulted in an unusual pattern of carbohydrate changes. Maltose concentration increased with temperature to 70 C, while

alcohol insoluble solids (AIS) correspondingly decreased, possibly due to heat induced β-amylase activity. Maltose decreased with temperature increase (70 to 80 C), while glucose and AIS concentration decreased. Differences in carbohydrates between mashes of two genotypes of sweet potatoes were also measured. These results suggest that rapid heating of sweet potato mashes to 80 C may be optimal for starch convertion and handling of the mashes prepared for ethanolic fermentation. MVG

Alfalfa

2006 MAGARAM (MF), STOTTS (CL), CHEN (TS), SMITH (CH) and KIRSCH (AJ). Folacin content of alfalfa and mung bean sprouts: The effect of extraction procedures and maturity. **J. Sci. Food Agric. 36**(11); 1985; 1155-60

The folacin content determined by **Lactobacillus casei** indicated the optimum conditions for extraction as autoclaving the sprouts in phosphate buffer containing 0.3% and 0.4% ascorbate, respectively, before homogenisation in a blender. Optimum blending time in 120 seconds for mung bean and 15 seconds for alfalfa sprouts. During germination, folacin content increased several times and it was 186 and 178 µg/100 g fresh weight for alfalfa and mung bean sprouts. KAR

Celery

2007 CHAUDHARY (SK), CESKA (O), WARRINGTON (PJ) and ASHWOOD-SMITH (MJ). Increased furocoumarin content of celery during storage. **J. Agric. Food Chem. 33**(6); 1985; 1153-7

Diseased celery infected with the fungus **Sclerotinia sclerotiorum** had greatly increased levels of three phytoalexin fuorocoumarins, namely psoralen, 5-MOP, and 8-MOP, which are responsible for skin photosensitivity. Storage of freshly harvested celery at 4 C resulted in clear signs of fungal infection, from latent fungus, appearing within 23-29 days, with concomitant increases in total furocoumarin levels from 1.84 ppm (wet weight) to 43.82 ppm and with occasional samples as high as 95.52 ppm. Psoralen, the most active of the DNA photoalkylating furocoumarins, increased during storage from <0.06 to 14.14 ppm and on occasions 24.24 ppm. A combination of [illegible], TLC, and an extremely sensitive photobiological assay was used to obtain these results, which are discussed in relation to possible health consequences. AA

Cucumbers

2008 POTTS (EA), FLEMING (HP), McFEETERS (RF) and GUINNUP (DE). Equilibration of solutes in nonfermenting, brined pickling cucumbers. **J. Food Sci. 51**(2); 1986; 434-9

The effects of temperature, cucumber size, cucumber lot and peeling of cucumbers on equilibration of solutes have been studied. MVG

Tomatoes

2009 COREY (KA), SCHLIMME (DV) and FREY (BC). Peel removal by high pressure steam from processing tomatoes with yellow shoulder disorder. **J. Food Sci. 51**(2); 1986; 388-90, 394

Fruits of processing tomatoes were peeled using high pressure steam with laboratory and commercial equipment. Recovery ranged from 64.8% to 77.8% and quantity of adhering peel ranged from 385 to 1866 mg/kg fruit for nine genotypes steam peeled at 4.4 bar. Recovery decreased with increasing steam pressure and dwell time for VF 134 and Castieny 1509. Quality of peeled Castlehy 1509 was superior to VF 134

fruit due to lack of yellow shoulder disorder (YSD) and consequent low quantities of adhering peel. Equations for prediction of % recovery of adhering peel as functions of steam pressure, dwell time, and % YSD were developed based on results of the lab scale experiments. AA

2010 MERLO (CA), ROSE (WW), PEDERSEN (LD) and WHITE (EM). Hyperfiltration of tomato juice during long term high temperature testing. J. Food Sci. 51(2); 1986; 395-8

A tubular hyperfiltration membrane system was studied with tomato juice in a recirculation mode. Two aromatic polyamide thin film composite membranes (ZF 99) (1.3 $cm^2$) were examined. After 52 hours of operation with tomato juice, one membrane exhibited a flux of 39.7 $Lm^{-2}hr^{-1}$ (72 C, 55.2 bar). Another membrane, after 717 hours gave a flux of 41 $Lm^2hr^{-1}$ (78 C, 41.4 bar) and natural tomato soluble solids (NTSS) rejection of 94 to >98%. AA

2011 XU (S-Y), SHOEMAKER (CF) and LUH (BS). Effect of break temperature on rheological properties and microstructure of tomato juices and pastes. J. Food Prot. 51(2); 1986; 399-402, 407

The rheological properties and microstructure of canned juices and pastes made from four tomato cultivars at three breaking temperatures of 85, 96 and 107 C were studied. The apparent viscosities of tomato juices and pastes at a constant shear rate vary with cultivars and processing conditions. The hot break process produced a high viscosity product. The microstructure of tomato pastes and juices were related to the rheology. The microstructure of tomato juice and paste also vary with processing conditions. AA

2012 MERLO (CA), ROSE (WW), PEDERSEN (LD), WHITE (EM) and NICHOLSON (JA). Hyperfiltration of tomato juice: Pilot plant scale high temperature testing. J. Food Sci. 51(2); 1986; 403-7

A two-stage tubular hyperfiltration (reverse osmosis) pilot plant equipped with 15.6 $m^2$ of aromatic polyamide thin film composite membrane (ZF 99) was studied with tomato juice (4-6% natural tomato soluble solids [NTSS]). It was operated over 100 hours in recirculation and single pass modes. The single pass mode was operated at 33-38 bar (feed inlet pressure) and 70-93 C for 18.2 hours. Stage I flux was 48 to 34 $Lm^{-2}hr^{-1}$, Stage 2 flux was 30 to 20 $Lm^{-2}hr^{-1}$. Concentration went to 7.4-9.0% NTSS at 8.6 L/min,and to 6.3-6.4% NTSS at 18.6 L/minutes NTSS rejection was > 98%. Of permeate samples tested none showed detectable levels of sugars; only 25% showed detectable levels of organic acids. AA

## FRUITS

2013 BOERIO (G) and LUISA BRUNETTI (M). Processing of fruit and vegetable products in India. Ind. Aliment. 24(12); 1985; 995-1000 (Italian)

2014 BOURNE (MC) and COMSTOCK (SH). Effect of temperature on firmness of thermally processed fruits and vegetables. J. Food Sci. 51(2); 1986; 531-3

The firmness of many commercially canned fruits and vegetables was measured by puncture, extrusion and Texture Press over the temperature range 3-48 C. The firmness almost always decreased with increasing temperature and the firmness-temperature plots were rectilinear. The firmness-temperature coefficient (FT) is defined as the per cent change in firmness per degree temperature increase. It ranged from close to zero to about -1.0% for most of the samples tested. The temperature should be kept within narrow limits when making firmness

measurements on thermally processed fruits and vegetables, otherwise significant errors can be introduced. AA

2015 MONRO (JA), HOLLOWAY (WD) and LEE (J). Elemental analysis of fruits and vegetables from Tonga. **J. Food Sci. 51(2)**; 1986; 522-3

2016 SINSEL (JA), BARDUN (RL) and PETERSON (CH). Effects of dithiocarbamate fungicides on corrosion mechanisms and shelf-life behaviour of light acid fruits in plain tin containers. **J. Food SCi. 52(2)**; 1986; 424-30

From the results of monitoring commercial test packs, synthetic test packs, and related laboratory experiments, the effects of dithiocarbamate fungicide residues on the shelf-life of canned acid fruits in plain tin containers have been clearly demonstrated. It has been shown that the sulphur compounds resulting from the decomposition of the fungicides are the active species and, depending on the quantity of fungicide initially present, can control corrosive failure through pitting corrosion mechanisms. Steel chemistry has also been shown to be an important factor in these interactions as evidenced by the superior performance of aluminium deoxidized continuous cast containers when compared to containers produced from type L ingot steel. AA

2017 BENK (E). Exotic fruits for the preparation of jams and jellies. **Gordian. 85(6)**; 1985; 122-5 (German)

The author has discussed the suitability of various exotic (i.e. tropical and sub-tropical) fruits for the preparation of jams and jellies. He has given a description and reported the proximate composition of the following fruits: cashew apple, guanabana (**Anona muricata**), guava, kaki (or Chinese quince), carambole (Averhoa carambole), kiwi (or Chinese gooseberry), mango, papaya, passion fruit, loquat, cumquat (or dwarf orange) and pomelo. KMD

Apples

2018 DRILLEAU (JF). Transformation of apples and production of cider in France. **Ind. Aliment. Agric. 102(9)**; 1985; 885-8 (French)

Cider has been traditionally produced in France by a slow and partial fermentation (several weeks, and often several months). It was naturally carbonated; very aromatic, and low in acidity; in certain region it possessed a slight bitterness. All these characteristics were reinforced by the residual sugar. But this technology is now undergoing a profound change due to a) use ofcontinuous presses; b) cold diffusion of the must; c) improvements in centrifugal and filtration apparatuses; d) new system of tangential filtration; e) possibility of using selected strains of microorganisms. KMD

2019 DOZIER (WA) Jr., RYMAL (KS), KNOWLES (JW), PITTS (JA) and REED (RB). Residue levels of daminozide in apple trees sprayed the preceding spring and summer. **J. Food Prot. 48(12)**; 1985; 1058-61

Bananas

2020 THOMAS (P) and JANAVE (MT). Isoelectric focusing evidence for banana isoenzymes with mono and diphenolase activity. J. Food Sci. 51(2); 1986; 384-7

Isoelectric focusing on thin layers of Sephadex G-75 superfine gel followed by the print technique was used to investigate the presence of polyphenol oxidase isoenzymes in banana fruits. Th enzyme preparation from pulp tissues of unripe "Dwarf Cavendish" bananas, partially purified by $(NH_4)_2SO_4$ fractionation, revealed 14 isoenzymes having both monophenolase (p-cresol substrate) and diphenolase (dopamine or catechol substrate) functions with isoelectric points (pI) in

the pH range 4-5.5. Similarly,two strains of the cv "Red Skin" showed 10 and 13 isoenzymes with pI in the pH range 4-5.8, most of which were capable of hydroxylation of monophenols. Individual isoenzymes exhibited variations in their activity towards mono and o-diphenols. AA

Blackberries

2021 SCHUSTER (B) and HERRMANN (K). Formation of hydroxybenzoic acids from flavonoids by enzymatic and alkaline hydrolyses. Z. **Lebensmittel. Unters. Forsch.** 181(6); 1985; 467-9 (German)

Extracts of blackberries were hydrolysed enzymatically and examined for hydroxybenzoic acids. Fractions containing anthocyanins were isolated by preparative HPLC and PC and upon enzymatic hydrolysis protocatechuic acid was detected. In this fractions it could be shown, that hydroxybenzoic acids result from enzymatic hydrolysis of anthocyanins using a non-specific enzyme. After alkaline hydrolysis, hydroxybenzoic acids could also be obtained from anthocyanins and other flavonoids. AA

Citrus

2022 PARISH (ME), BRADDOCK (RJ) and GRAUMLICH (TR). Chemical and microbial characterization of citrus oil-mill effluent. **J. Food Sci.** 51(2); 1986; 431-3

The centrifuge aqueous discharge from a typical citrus processing peel oil recovery process was chemically and microbially characterised to provide information for improvement of work treatment or utilisation of the effluent. The aqueous discharge used in this study contained approximately 2.6 % sugar and 0.28 % limonene. Considering a potential production of 3 to 8.5 billion litres of effluent during a typical processing season in USA, this would mean utilisation of between 28,000 and 2,20,000 kg of fermentable sugars and from 7,000 to 20,000 kg of limonene. There was an antimicrobial activity with limonene content of this waste stream as evidenced by the inability of several microbial isolates sustain growth after inoculation into the pasteurised effluent. Decreased levels of limonene were not correlated with microbial activity or growth. MVG

Grapes

2023 BAKKER (J) and TIMBERLAKE (CF). The distribution of anthocyanins in grape skin extracts of port wine cultivars as determined by high performance liquid chromatography. **J. Sci. Food Agric.** 36(12); 1985; 1315-24

The paper describes the distribution of anthocyanins in methanolic skin extracts of 16 grape cultivars used for port wine production and grown at five sites in the Douro Valley in Northern Portugal. KAR

2024 SOMERS (TC) and ZIEMELIS (G). Spectral evaluation of total phenolic components in **Vitis vinifera**: Grapes and wines. **J. Sci. Food Agric.** 36(12); 1985; 1275-84

For **Vitis vinifera** the non-phenolic UV background absorbance at 280 nm and 320 nm are sufficiently uniform to enable estimation of the total hydroxyciannamates in juices and white wines, and evaluation of the total flavonoid phenolics in natural wines, in terms which refer to degree of extraction of grape solids and to conduct of the vinification process. KAR

Raisins

2025 SARAVACOS (GD), TSIOURVAS (DA) and TSAMI (E). Effect of temperature on the water adsorption isotherms of Sultana raisins. J. Food Sci. 51(2); 1986; 381-3; 387

Water adsorption isotherms of Sultana raisins were determined at 20, 25, 30 and 35 C using static method of saturated salt solutions. At aws upto 0.70, the equilibrium moisture content decreased with temperature increase from 20 to 35 C. At higher aws the moisture content increased sharply with temperature resulting in crossing of the isotherm curves. This behaviour was attributed to the increased solubility of fruit sugars at higher temperatures. The data obtained corresponded well with the 3-parameter GAB and Halsey equations; it filled test with D'Arcy-Watt equation. The thermodynamic implications are also discussed. MVG

Grapefruits

2026 BEN-SHALOM (N), LEVI (A) and PINTO (R). Pectolytic enzyme studies for peeling of grapefruit segment membrane. J. Food Sci. 51(2); 1986; 421-3

In vitro studies of commercial pectolytic enzymes with grapefruit membranes and citrus pectin were conducted to determine optimum conditions for peeling membranes from grapefruit segments. Alcohol-insoluble solids residue (AIS) extracted from washed membrane consisted of 46% pectic substances and 25% neutral sugars. The main neutral sugar of AIS was glucose, followed by arabinose and xylose. Optimum conditions for degradation of segment membranes by pectinase "C-80" were: pH between 4.0 and 5.0 at 55 C., Optimum temperature for degradation of commercial pectin was 50 C; this indicates that optimum conditions for enzymatic activation depend also on the substrate degraded. The enzyme was fully inactivated after 1 minute at 80 C. This study provides additional basic information for industrial application of enzymatic peeling of citrus segments. AA

Oranges

2027 STEWART (I). Identification of caffeine in citrus flowers and leaves. J. Agric. Food Chem. 33(6); 1985; 1163-5

Caffeine was isolated and identified in extracts from flower buds of several citrus cultivars and from leaves of Valencia oranges (**Citrus sinensis** L. Osbeck). No caffeine was detected in orange juice. Identification was by high-performance liquid chroamtography (HPLC), was chromatography (GC), ultraviolet spectroscopy (UV), and mass spectra (MS). AA

Guava

2028 AUGUSTIN (MA), GHAZALI (HM) and HASHIM (H). Polyphenoloxidase from guava (**Psidium guajava** L.). J. Sci. Food Agric. 36(12); 1985; 1259-65

Purification of polyphenoloxidase (PPO) by acetone precipitation and dialysis of the Amicon concentrate resulted in 4.9-fold and 17.2-fold purification of the dialysed crude extract respectively. PPO had a molecular weight of 120 000-140 000. pH optimum of the enzyme was 7.2. Heating for 1.1, 3.5 and 10.1 minutes at 75, 65 and 55 C respectively caused 50% loss in enzymic activity. KAR

Melons

2029 BRUTON (BD) and TABER (RA). Grey rot of cantaloupe: A new post-harvest decay caused by **Botryosphaeria dothidea**. Trop. Sci. 25(4); 1985; 231-4

Peaches

2030 AUSTIN (RK) and PHILLIPS (DJ). Use of a standard-addition bromide-selective electrode technique to determine bromide and trace its migration in peaches. J. Agric. Food Chem. 33(6); 1985; 1165-8

Strawberries

2031 MAIN (GL), MORRIS (JR) and WEHUNT (EJ). Effect of preprocessing treatments on the firmness and quality characteristics of whole and sliced strawberries after freezing and thermal processing. J. Food Sci. 51(2); 1986; 391-4

Soaking or vacuum infiltrating in 1 or 2 % Ca lactate solutions increased fruit firmness of overripe strawberries. Ca lactate was more effective in firming sliced than whole fruit. Fruits, thermaly processed, benefited more from Ca absorption than frozen fruit. Infiltration of Ca lactate increased firmness of whole fruit. Sliced fruit firmness was increased more with soak treatment without vacuum than vacuum infiltration. Slight, but significant differences between treatments were observed in respect of all quality attributes tested. But, these differences had no commercial importance. MVG

## SUGAR, STARCH AND CONFECTIONERY

Sugar

2032 CHINACHOTI (P) and STEINBERG (MP). Moisture hysteresis is due to amorphous sugar. J. Food Sci. 51(2); 1986; 453-5

Hysteresis, the moisture discrepancy between absorption and desorption, of sucrose-waxy maize starch mixture was studied. Starch was raw, partially and completely gelatinized. Hysteresis of raw starch was insignificant. Gelatinized starch showed slight hysteresis, 0.02 g w/g starch, in the range 0.57 to 0.84 $a_w$. Sucrose showed no hysteresis. However, sucrose-starch mixtures showed a large hysteresis, e.g., 0.15 g w/g mix, which occurred only at $a_w$ below 0.86, the saturation $a_w$ for sucrose. Hysteresis showed a close linear correlation with the amount of amorphous sucrose (X-ray diffraction) present. The amount of water sorbed by amorphous sucrose as calculated from the experimental data was in a good agreement with literature data. AA

2033 SCHREIER (P). Boiling point and temperature conversion tables. Gordian. 85(10); 1985; 218 (German)

The drop in the boiling-point of sugar solutions at increasing altitudes has been tabulated. Another table gives the temperature equivalents in degrees Reaumur, degrees Fahrenheit, degrees Baume, as well as the moisture content, and feel (or texture) of sugar solutions heated to temperatures ranging from 102 to 150 C. KMD

2034 ALARD (G) and de MINIAC (M). Recycling of residuary liquors and their condensates of evaporation, in the alcoholic fermentation of heavy sugar products (molasses and effluents). Ind. Aliment. Agric. 102(9); 1985; 877-82 (French)

Recycling of the effluents of alcoholic fermentation has been studied from the two angles: (i) condensates of residuary liquid evaporation during fermentation of molasses; and (2) residuary liquors in EP2 fermentation. The results obtained in the latter case (EP2 liquors) are very encouraging due to (a) a gain in ethanol production and in the fermentation balance, and (b) total absence of any inhibitor. Thus, recycling of the evaporation condensates of residuary

liquid from molasses should be possible; it would depend, probably, on the quality of the molasses which are, themselves, more or less loaded with volatile organic acids. KMD

Sucrose

2035 PABST (HME), LEDL (F) and BELITZ (H-D). Bitter compounds obtained by heating sucrose, maltose and proline. Z. Lebensmittel Unters. Forsch. 181(5); 1985; 386-90 (German)

In addition to the mono- and dipyrrolidinohexose- reductones described recently (Z Lebensm Unters Forsch (1984) 178:356) two further bittertasting compounds were isolated from heated mixtures of porline and sucrose (molar ratio 3:1, 190 C, 30 minutes) and also synthesized, namely 2,3-bis-(1-pyrrolidinyl)-2-cyclopenten-1-one and 2,3-bis(1-pyrrolidinyl)-5-methyliden-2-cyclopenten-1-one. The recognition thresholds (mmol/l) are 0.15-0.25 and 0.06-0.12 respectively. Both compounds have a burning bitter taste character. From the maltose-proline reaction mixture 2-$\alpha$-glucosyl-5-hydroxy-5-methyl- 4-piperidinyl-2-cyclopenten-1-one was isolated. When the dihydroxypyranone VI was heated with proline, 2,5-dihydroxy-5-methyl-4-prolinyl-2-cyclopenten-1-one and the cyclopent(b)azepinones XI and XII were among the compounds formed. These compounds also have a bitter taste character. AA

2036 KIMBALL (DA). Volumetric variations in sucrose solutions and equations that can be used to replace specific gravity tables. J. Food SCi. 51(2); 1986; 529-30

Oligosaccharides

2037 KENNEDY (JF), NOY (RJ), STEAD (JA) and WHITE (CA). Oligosaccharide component composition and storage properties of commercial low DE maltodextrins and their further modifications by enzymatic treatment. Starch. 37(10); 1985; 343-51

Starch

2038 XU (S-Y) and SHOEMAKER (CF). Gelatinization properties of Chinese water chestnut starch and lotus root starch. J. Food Sci. 51(2); 1986; 445-9

A microscope heating-stage and different scanning calorimetry were used to characterize the gelatinization of lotus root starch and water chestnut starch. The effect of varying concentrations of different sugars on gelatinization temperature was also studied. AA

2039 CHINACHOTI (P) and STEINBERG (MP). Interaction of solutes with raw starch during desorption as shown by water retention. J. Food Sci. 51(2); 1986; 450-52

The objective was to study interaction of salt and sucrose with raw starch as determined from water retention at a given $^{a}_{w}$. NaCl-starch mixtures were 5.95, 10.90, 15.85 and 25:75. Sucrose-starch mixtures were 1:9, 2:8, 1:1 and 9:1. Equilibration was against salt slushes over the aw range 0.33 to 0.97. At each $^{a}_{w}$, as the solute concentration increased above zero, the amount of interacted solute rose to a maximum and then, in contrast to previous findings with protein, declined to zero. For each solute, saturation aw showed the highest amount of interaction at any solute concentration; the interaction decreased with increaing $^{a}_{w}$ At maximum, 87.2% of total NaCl and 56.3% of the total sucrose interacted with starch. These desorption data showed less interaction than previously found for absorption. AA

2040 KARTHA (KPR) and SRIVASTAVA (HC). Reaction of epichlorohydrin with carbohydrate polymers. Part I. Starch reaction kinetics. **Starch.** 37(8); 1985; 270-76

The starch-epichlorohydrin (ECH) reaction follows second order kinetics, first order with respect to ECH as well as starch. The activation energy for the reaction is of the order of 38 kJ/mole and the temperature coefficient $K_{323}/K_{303}$ is of the order of 2. AA

2041 VARRIANO-MARSTON (E), ZELEZNAK (K) and NOWOTNA (A). Structural characteristics of gelatinized starch. **Starch.** 37(10); 1985; 326-9

2042 WOOTTON (M), KESAVAMOORTHY (S) and AZEMI (BMNM). Analysis of hydroxypropyl starch hydrolysates by high performance liquid chromatography. **Starch.** 37(8); 1985; 276-9

Acid hydrolysates of hydroxypropyl derivatives of wheat, maize, waxy maize and high amylose maize starches were separated using four HPLC procedures. An amine treated silica column gave best resolution of glucose and six nonglucose components. The proportions of these varied depending on the native starch and the acid used for hydrolysis. There was a linear relationship between molar substitution and ratio of nonglucose to glucose peak areas which varied between the native starches. AA

2043 BENCHEVA (S), NEDELCHEVA (M) and VALCHEV (V). Study of the effect of pH during dialdehyde starch (DAS) adsoprtion on cellulose. **Starch.** 37(8); 1985; 279-81

The adsorption of dialdehyde starch (DAS) by its water solutions of different concentrations on sulphate and sulphite bleached cellulose is studied in the presence of aluminium sulphate depending on pH of the media. It was found that for both cellulose types the character of the change of the DAS adsorbed quantity depending on pH is similar and it is defined by the concentration of the solution. It was found that at the low DAS concentrations the interaction of the cellulose with aluminium sulphate appears as defining, and at the higher ones the interaction between DAS and aluminium sulphate. In the presence of aluminium sulphate, the quantity of the adsorbed DAS increases slowly (sulphate bleached pulp) or has almost the same values, as in the case of adsorption when the aluminium sulphate is lacking (sulphite bleached pulp). AA

Chocolate

2044 GELOSA (L). **Salmonella napoli** contamination in chocolate products. Ind. Aliment. 24(11); 1985; 899-907

## BAKERY PRODUCTS

2045 MEUSER (F), LENGERICH (Bvan) and STENDER (J). Formation of starch-lipid complexes by extrusion cooking. Part 2. Functional properties of extrudates. **Getreide Mehl. Brot.** 39(10); 1985; 309-14 (German)

The functional properties of starch-lipid extrudates produced by extrusion cooking have been studied with a view to their use as baking agents. The solubility of these extrudates depended on the type and concentration of the lipid that was used. The solubility of such extruded products was always less than that of wheat-starch extrudates prepared with a comparable energy consumption. Each of the lipids used had a specific effect on the viscosity behaviour of the extrudate. The viscosity was found to depend principally on the state of loosening of the starch structure, which is correlated with the energy consumption during extrusion. When starch-lipid extrudates (containing 2-4% of

lipid) are used at the 4% level (w.r.t. flour) in a baking recipe, they lead principally, to an improvement in the fresh-keeping quality of the end product.This was particularly noticeable in the case of wheat-flour/soya-lecithin extrudate. KMD

Bread

2046 NAUMANN (G). Microwave pasteurization of sliced bread without preservatives. **Getreide Mehl Brot.** 39(10); 1985; 306-9 (German)

The time required for pasteurization of sliced bread is much shorter when microwave energy is used than when the heating is done in a normal oven. The product gives a good impression of freshness, and no changes can be noticed in its taste or appearance. Microwave pasteurization would be more economical only if a microwave unit of the correct size is used in accordance with the appropriate know-how. KMD

2047 MAGRIAN (L), PAGENKOPF (J), SCHILLING (M) and SELL (U). Detectability of sugar couleur in bread. **Dtsch. Lebensmittel-Rundsch.** 81(12); 1985; 379-84 (German)

Sugar couleur is being added to bread increasingly, not only to produce a dark and rich colour,but also to improve the taste of bread. Hence, the authors have applied a gel chromatographic method - described earlier for the detection of sugar couleur in wine - to bread also. It was found that while sugar couleur produces hardly any improvement in the taste of bread, it does darken the bread, and thereby can create a false impression of (i) a higher proportion of rye in bread, (ii) a higher degree of extraction, or (iii) a longer period of baking. The analytical method described in this paper can detect the presence of sugar couleur at the level of 0.2%. Sugar couleurs with ammonia, which are frequently employed, contain 4-methyl-imidazol; the latter can be detected by thin-layer chromatography. KMD

2048 SEIBEL (W). Results of the 27th quality tests and evaluation of bread by the Deutsche Landwirtschaftsgesellschaft (DLG). **Getreide Mehl Brot.** 39(10); 1985; 301-6 (German)

Cakes

2049 BRACK (G) and BRETSCHNEIDER (F). Baking-technological effects of lactose in madeira-cake and sponge-cake batters. **Getreide Mehl Brot.** 39(9); 1985; 267-75 (German)

Lactose was used instead of sucrose in several recipes for madeira cake and sponge cake. The optimum level of substitution was found to be 30%. Using lactoses madeira cake could be made with less of fat, and hence at a lower cost. The effects of lactose substitution on working up of the mass, and on behaviour during baking and storage were also studied. Lactose is responsible mainly for a change in the chewing quality of the cakes. The lesser sweetness of lactose is advantageous in receipes that require a lot of sugar. When lactose replaces 30% or more of sucrose, the $a_w$-value can rise by 1 to 3%; this fact can affect microbiological keeping quality of the product. KMD

Pasta

2050 OLIVIER (JL). Drying of long and short paste goods at very high temperatures. **Getreide Mehl Brot.** 39(10); 1985; 314-7 (German)

The Bassano-THT (very high temperature) process uses drying temperatures higher than 100 C. Consequently, the microbiological-hygienic quality of the dried pasta products is very much better, and their cooking behaviour also improved. Losses of lycine are lower than those at lower drying temperatures. Energy consumption, too, is more

favourable (i.e. less) than in the conventional drying installations. KMD

Spaghetti

2051 SEIBEL (W), MENGER (A), PFEILSTICKER (K) and SCHREURS (E). Influence of the cooking water on the cooking quality of pasta products in relation to the quality of the uncooked pasta. Part 1. Relationship between the amount of washed out pasta substance and the sensoric evaluation of cooked spaghetti. **Getreide Mehl Brot. 39**(9); 1985; 275-82 (German)

## MILK AND DAIRY PRODUCTS

Milk

2052 GILLIS (WT), CARTLEDGE (MF), RODRIGUEZ (IR) and SUAREZ (EJ). Effect of raw milk quality on ultra-high temperature processed milk. **J. Dairy Sci. 68**(11); 1985; 2875-9

2053 CRUDGINTON (DR). Determination of fat in dried milk: Collaborative trial. **J. Assoc. Publ. Anal. 23**(4); 1985; 103-5

In a collaborative study by eight laboratories of official EEC method for determination of fat in dried milk, the repeatability and reproducibility derived were 0.17 and 0.54% respectively at the 1% fat level and 0.32 and 0.73% respectively at the 13% level. At 26% fat level, these values were 0.32 and 1.09 respectively. BSN

2054 ROSS (SA) and CLARK (RM). Nitrogen distribution in human milk from 2 to 16 weeks postpartum. **J. Dairy Sci. 68**(12); 1985; 3199-201

Total nitrogen in human milk decreased from 2.18 mg/ml at 2 weeks to 1.76 mg/mL at the end of 16 weeks. However,the percentage of nonprotein nitrogen was 19% which remained constant with postpartum. Urea nitrogen averaged 0.14 mg/ml which also remained constant. Protein nitrogen decreased from 1.77 mg/ml at 2 weeks to 1.42 mg/ml at 16 weeks. The percentages of non protein, whey nitrogen and casein nitrogen remained relatively constant as the total nitrogen in milk changed. BSN

2055 MORGAN (JN), TOLEDO (RT), EITENMILLER (RR), BARNHART (HM) and MADDOX (F). Thermal destruction of immunoglobulin A, lactoferrin, thiamin and folic acid in human milk. **J. Food Sci. 51**(2); 1986; 348-51

2056 CHIANG (BH) and CHERYAN (M). Ultrafiltration of skimmilk in hollow fibers. **J. Food Sci. 51**(2); 1986; 340-44

A resistance-in-series approach was used to model the flux of a hollow fiber ultrafiltration module of skim milk for use in for designing ultrafiltration plants and to get an insight into the mechanism of ultrafiltration. The optimum with this system appeared to be a combination of medium transmembrane pressures and the highest possible velocity consistent with pressure limits of the module. Temperature, though not a statistically significant parameter, should be high enough to minimise microbial problems but not high enough to cause heat-induced degradation reaction. A temperature of 55-60 C was indicated to be optimum for the system. MVG

2057 FISCHBACH-GREENE (L) and POTTER (NN). Effects of ultrafiltration on retention of minerals and other components of milk. **J. Food Sci. 51**(2); 1986; 345-7

Ultrafiltration using membranes of different composition and

molecular weight cut offs, milks at different stages of processing, and concentration factors of 2.0 x and 1.5 x was carried out and retentions of milk components was determined. Membrane composition, molecular weight cut-off, pasteurisation or homogenisation did not affect component retentions. Whole milk showed a higher percent recovery of total solids than skim milk. Total solid retention of pasteurised, homogenised milk was more at concentration of 1.5 x than at 2.0 x; mineral retentions were, however affected appreciably. In all milks, protein retention was more or less complex (93-100 %), while transfer of lactose through the membrane was similar to that of water. Little variation were found with mineral retention from milk to milk. Retention from milks concentrated to 2.0 x gave individual recoveries of minerals of 16 different minerals (approximately 50 % to over 90 %). MVG

2058 BLACK (RG) and CUNNINGTON (BR). Detection of residues of hydrogen peroxide in pasteurized cream. J. Food Prot. 48(11); 1985; 987-9

A method used to detect $H_2O_2$ in milk is adapted for pasteurised cream by changing sample size and precipitant. It consists of mixing of cream with tungstic acid, filtering and reacting the $H_2O_2$ in the filtrate with titanium tetrachloride to produce a yellow-coloured complex absorbing at 415 nm. MVG

2059 OKIGBO (ON) and RICHARDSON (GH). Detection of penicillin and streptomycin in milk by impedance microbiology. J. Food Prot. 48(11); 1985; 979-81

A Bactometer 123 impedance instrument detected 0.001 IU penicillin or streptomycin/ml of sterile milk inoculated with 5% active lactic culture. Results were available in 5 to 10 hours. Inactive lactic culture produced results in less than 24 hours. Impedance instruments can monitor incoming milk supplies simultaneously for bacterial load, abnormal milk, and antibiotics. AA

2060 BEATTY (BR), FARNSWORTH (RJ), LUND (AJ), LYON (RH) and WARD (GE). Medium to culture and differentiate coagulase-positive and negative staphylococci from bovine milk. J. Food Prot. 48(12); 1985; 1019-21

A medium which incorporates CAMP factor produced by Streptococcus agalactiae (group B) into sheep blood agar was used to culture and identify coagulase-positive staphylococci from bovine milk. Of 506 staphylococcal isolates from bovine milk, 92.5% of coagulase-positive organisms produced a wide zone of complete hemolysis, whereas 98.9% of coagulase-negative organisms did not. The agreement of this one-step culture and identification test with the standard tube coagulase test was higher than that of the deoxyribonuclease test medium, Baird-Parker egg yolk medium, tellurite glycine medium and slide coagulase tests. AA

2061 STANFIELD (JT), JACKSON (GJ) and AULISIO (CCG). Yersinia enterocolitica: Survival of a pathogenic strain in milk containers. J. Food Prot. 48(11); 1985; 947-8

A strain of Yersinia enterocolitica isolated from a patient in milk-associated yersiniosis outbreak in Tennessee, Mississippi and Arkansas in the summer of 1982 was used to contaminate the exterior of refrigerated milk containers. The bacteria survived on the containers for as long as 21 days as shown by recovery of MacConkey agar plates or in veal infusion broth. Y. enterocolitica was not detected in milk poured from the contaminated containers. AA

Cheese

2062 CHANG (S-F), AYRES (JW) and SANDINE (WE). Analysis of cheese for histamine, tyramine, tryptamine, histidine, tyrosine and tryptophane. J.

Dairy Sci. 68(11); 1985; 2840-46

2063 MODLER (HW), POSTE (LM) and BUTLER (G). Sensory evaluation of an all-dairy formulated cream-type cheese produced by a new method. J. Dairy Sci. 68(11); 1985; 2835-9

2064 FITZGERALD (E) and BUCKLEY (J). Effect of total and partial substitution of sodium chloride on the quality of cheddar cheese. J. Dairy Sci. 68(12); 1985; 3127-34

2065 KEALEY (KS) and KOSIKOWSKI (FV). Cheddar cheese from ultrafiltered whole milk retentates in industrial cheese making. J. Dairy Sci. 68(12); 1985; 3148-54

2066 DUNN (HC) and LINDSAY (RC). Comparison of methods for the analysis of higher boiling flavour compounds in cheddar cheese. J. Dairy Sci. 68(11); 1985; 2853-8

2067 MARSILI (R). Monitoring chemical changes in cheddar cheese during aging by high performance liquid chromatography and gas chromatography techniques. J. Dairy Sci. 68(12); 1985; 3155-61

2068 DUNN (HC) and LINDSAY (RC). Evaluation of the role of microbial strecker-derived aroma compounds in unclean-type falvours of cheddar cheese. J. Dairy Sci. 68(11); 1985; 2859-74

2069 GREEN (ML), MARSHALL (RJ) and BROOKER (BE). Instrumental and sensory texture assessment and fracture mechanisms of cheddar and Cheshire cheeses. J. Texture Stud. 16(4); 1985; 351-64

Textural attributes of Cheddar and Chesnire cheeses, falling within narrow compositional ranges,were assessed by sensory panels, and from force-compression curves generated by compression between two plates, and, for Cheddar cheese only, by penetrometry. Individual sensory measurements did not relate well to any instrumental one, and were better at discriminating between cheeses. Samples of each cheese variety were fractured in different ways and the fracture surfaces were examined in a scanning electron microscope. Fracture surfaces were formed by cutting directly through the matrix, tearing of the matrix along planes high in fat or cracking at grain boundaries. It is suggested that consideration of fracture mechanism may aid the selection and development of useful instrumental methods for texture assessment of cheese. AA

2070 D'AOUST (J-Y), WARBURTON (DW) and SEWELL (AM). Salmonella typhimurium phage-type 10 from cheddar cheese implicated in a major Canadian food-borne outbreak. J. Food Prot. 48(12); 1985; 1062-6

2071 TOCHMAN (LM), STINE (CM) and HARTE (BR). Thermal treatment of cottage cheese "in-package" by microwave heating. J. Food Prot. 48(11); 1985; 932-8

Small curd cottage cheese in polystyrene tubes was subjected to microwave (.5 and 2.8 kw) heat treatments of 37 - 82.2 C. Cottage cheese in flexible pouches (laminates of ethylene vinyl acetate/PVC/ethylene vinyl acetate - EVA/PVDC/EVA) and polyethylene tubes) was also subjected to similar heat treatments. Samples were monitored until they were unacceptible for moisture, sineresis, microbial population, pH and sensory properties. The treated samples had a shelf life of 7 to 42 days. Heating to 48.8 C using the low power source gave optimum quality. Cheese packaged in flexible pouches had the longest shelf life. MVG

2072 BISHOP (JR) and WHITE (CH). Estimation of potential shelf life of cottage cheese utilizing bacterial numbers and metabolites. J. Food Prot. 48(12); 1985; 1054-7, 1061

2073 RONDININI (G), GARZAROLI (C) and OTTOGALLI (G). L.A.L. test technique applied to Italian cheeses. Ind. Aliment. 24(12); 1985; 1007-10

2074 JOHNSON (ME) and OLSON (NF). Nonenzymatic browning of mozzarella cheese. J. Dairy Sci. 68(12); 1985; 3143-7

2075 PARNELL-CLUNIES (EM), IRVINE (DM) and BULLOCK (DH). Composition and yield studies for queso blanco made in pilot plant and commercial trials with dilute acidulant solutions. J. Dairy Sci. 68(11): 1985; 3095-103

2076 ZERFIRIDIS (GK). Production of aflatoxins on inoculated Teleme cheese. J. Food Prot. 48(11); 1985; 961-4

Ice cream

2077 BRAY (F). Non-sucrose sugars in ice-cream production. Ind. Aliment. 24(11); 1985; 895-8 (Italian)

Recipes have been given for the manufacture of ice-creams in which sugar (i.e. sucrose) has been replaced by xylitol, maltitol, or aspartame. Comparative rheological and nutritive values have been reported in a table. KMD

2078 BUCK (JS), WALKER (CE) and PIERCE (MM). Evaluation of sucrose esters in ice cream. J. Food Sci. 51(2); 1986; 489-93

Sucrose esters were suitable for use in ice cream at levels comparable to emulsifiers currently being used. The sucrose esters imparted melting characteristics to ice cream. MVG

2079 BAER (RJ) and CZMOWSKI (TP). Use of the osmometer for quality control of ice cream mix. J. Food Prot. 48(11); 1985; 976-8, 981

2080 PARSONS (JG), DYBING (ST), CODER (DS), SPURGEON (KR) and SEAS (SW). Acceptability of ice cream made with processed wheys and sodium caseinate. J. Dairy Sci. 68(11); 1985; 2880-85

Whey

2081 CANEPA (P) and MARIGNETTI (N). Economical feasibility of whey concentration with ultrafiltration. Ind. Aliment. 24(12); 1985; 1001-6

A series of tests were operated with a semiindustrial pilot plant, using polysulphone membranes, in view of a project for large scale application of UF technology in whey concentration. Comparative evaluation was performed for design and cost in case of simple thermal-concentration and simple membrane-concentration, as functions of energy balance, operating cost and feeding conditions to spray-dryer as final operation of the process. The economical feasibility is discussed, including technical and economical aspects of permeate processing. AA

2082 JOST (R), BAECHLER (R) and MASSON (G). Heat gelation of oil-in-water emulsions stabilized by whey protein. J. Food Sci. 51(2); 1986; 440-45, 449

The conditions under which a high volume fraction of oil can be trapped in whey protein gels were studied. Oil-in-water emulsions of whey protein and vegetable oil were subjected to heat treatment. Such emulsions, depending on their protein and oil content, on their pH and on the emulsification technique used, gelled or remained liquid. Homo-

genization was the major factor to achieve gelation and the firmness of heat-induced gels increased with increasing emulsion fineness and homogeneity. Emulsions with a high gelation capacity were characterized by a single droplet family of relatively narrow size distribution and a mean droplet diameter ranging from roughly 300-700 nanometers. The pH range suitable for gelation extended from 3.5-8.0. AA

2083 MANJI (B), HILL (A), KAKUDA (Y) and IRVINE (DM). Rapid separation of milk whey proteins by anion exchange chromatography. **J. Dairy Sci.** 68(12); 1985; 3176-9

By employing a fast protein liquid chromatography system to fractionate major proteins of sweet and acid wheys using a stepwise ionic strength gradient using water (buffer A) and increasing concentrations of 0.7M sodium acetate, six well resolved peaks were observed. Time required to each sample including column clean up was 40 minutes. Column cleaning was done after each run through injection of 2 ml each of the following chemical reagents. Glacial acetic acid, 2N; 2N sodium chloride, 2% detergent and 100% acetonitrile. BSN

## MEAT AND POULTRY

### Meat

2084 JULINI (M), FAZIO (G) and FEDELE (V). Muscular necrosis due to inoculation of drugs in animals for slaughter. **Ind. Aliment.** 24(11); 1985; 915-8, 924 (Italian)

Necrotic lesions have been frequently observed in calves and pigs which had received intra-muscular injections of anti-biotic (oxytetracycline) drugs. The authors have examined the hygienic-sanitary and economic aspects of this practice, and the possible ways of preventing such necrotic lesions. KMD

2085 SEIDEMAN (SC). Methods of expressing collagen characteristics and their relationship to meat tenderness and muscle fiber types. **J. Food Sci.** 51(2); 1986; 273-6

Bulls were found to have more total collagen than steers and varied within muscles for their collagen content. There was high correlation between total collagen and sensory tenderness ratings while the quantity of soluble collagen was strongly correlated to instrumental textural properties. Correlation coefficients between quantity of total collagen and soluble collagen and percentage red muscle fibres were 0.5 and 0.32, respectively, for bulls and -0.31 and -0.46, respectively for steers. The correlation between percentage collagen solubility and tenderness was -0.71 for bulls and -0.36 for steers. MVG

2086 KENNEY (PB), HENRICKSON (RL), CLAYPOOL (PL) and RAO (BR). Influence of temperature, time and solvent on the solubility of corium collagen and meat proteins. **J. Food Sci.** 51(2); 1986; 277-81, 287

2087 FOOLADI (MH), PEARSON (AM), MAGEE (WT) and GRAY (JI). Comparison of some one, two- and three- component systems for similarity to meat flavour using surface response methodology. **J. Food Sci.** 51(2); 1986; 504-7

2088 JANSUITTIVECHAKUL (O), MAHONEY (AW), CORNFORTH (DP), HENDRICKS (DG) and SISSON (DV). Effect of heat treatment on meat enhancement of dietary iron bioavailability of meat/ferrous sulphate and meat/hemoglobin mixtures fed to anemic rats. J. Food Sci. 51(2); 1986; 263-7

The effect of autoclaving on meat enhancement of dietary iron

bioavailability of iron was studied. Meat, mixed with $FeSO_4$ or haemoglobin to obtain meat to iron ratios of 100:0, 75:25, 50:50, 25:75 and 0:100 was used. Heat increased the haemoglobin regeneration efficiency (HRE) of meat/haemoglobin mixtures or haemoglobin. Heat did not affect the HRE of meat or meat/ferrous sulphate mixtures, and the enhancement of bioavailability of total dietary iron. MVG

2089 HAREL (S) and KANNER (J). Muscle membranal lipid peroxidation initiated by $H_2O_2$ activated metmyoglobin. **J. Agric. Food Chem.** 33(6); 1985; 1186-92

Metmyoglobin (MetMb) $H_2O_2$ activated by glucose-oxidase/glucose system, initiated membranal lipid peroxidation. No such peroxidation occurred in the presence of the glucose oxidase system, $H_2O_2$ or MetMb alone. Heated MetMb maintained its capacity to be activated by $H_2O_2$. The accumulation of thiobarbituric reactive substances (TBA-RS) and oxygen absorption showed a higher rate of lipid peroxidation by H2O2-activated MetMb in microsomes separated from turkey than from chicken muscle tissues. Membranal lipid peroxidation initiated by activated MetMb was inhibited by low concentrations of either ascorbyl palmitate, $\alpha$-tocopherol, or butylated hydroxytoluene (BHT). Inhibition was also observed by very low concentrations of ascorbic acid in the presence of EDTA. Only very high concentration of EDTA (1-10 mM) inhibited significantly membranal lipid peroxidation by activated metmyoglobin. AA

2090 MACFARLANE (JJ) and McKENZIE (IJ). Pressure-accelerated changes in the proteins of muscle and their influence of Warner-Bratzler shear values. **J. Food Sci. 51**(2); 1986; 516-7, 525

2091 PIIRONEN (V), SYVAOJA (E-L), VARO (P), SALMINEN (K) and KOIVISTOINEN (P). Tocopherols and tocotrienols in Finnish foods: Meat and meat products. **J. Agric. Food Chem.** 33(6); 1985; 1215-8

2092 SEBRANEK (JG) and FOX (JB) Jr. A review of nitrite and chloride chemistry: Interactions and implications for cured meats. **J. Sci. Food Agric.** 36(11); 1985; 1169-82

2093 HAUSCHILD (AHW) and SIMONSEN (B). Safety of shelf-stable canned cured meats. **J. Food Prot. 48**(11); 1985; 997-1009

2094 RACCACH (M). Lactic acid fermentation using high levels of culture and the fate of **Staphylococcus aureus** in meat **J. Food Sci. 51**(2); 1986; 520-21, 523

The fermentation period of beaker sausage was reduced by 39% when the inoculation level of pediococici was increased from log 7.5 to 8.8 CFU/g. Inoculation levels of log > 8.0 CFU/g reduced threefold the log period of measurable change in the pH value of meat. **S. aureus** FRI 100 in beaker sausage decreased in population at all levels of pediococci., Pediococci (log 8.8 CFU/g) in regular sausage controlled the aerobic and anaerobic growth of **S. aureus** Z-88. Nitrite-free regular sausage supported the largest increase in the aerobic population of this strain. **S. aureus** FRI 100 and 722 decreased in population in both the aerobic and anaerobic portions of regular sausage. AA

Beef

2095 GOTTESMANN (P) and HAMM (R). Lipoamide dehydrogenase, citrate synthase, and $\beta$-hydroxyacyl-CoA-dehydrogenase of skeletal muscle. XII. Influence of electrical stimulation of beef carcasses on activity and subcellular distribution. Z. Lebensmittel Unters. Forsch. 181(6): 1985; 478-81 (German)

The effect of electrical stimulation (ES) of beef carcasses at

450 V on the total extractable activity and subcellular distribution of the mitochondrial enzymes lipoamide dehydrogenase, citrate synthase and β-hydroxyacyl-CoA-dehydrogenase in skeletal muscle (activities in the supernatant of a phosphate buffer extract and in muscle press juice) was studied. There was no influence of ES on the total activity and the subcellular distribution of these enzymes in the muscle tissue stored at +2 C for 7 days nor did ES influence the extent of the release of the three enzymes from the mitochondria into the sarcoplasm by freezing (-20 C) and thawing. From these results it can be concluded, that ES does not result in an appreciable disintegration of the inner membrane of muscle mitochondria. AA

2096 LYNCH (NM), KASTNER (CL) and KROPF (DH). Consumer acceptance of vacuum packaged ground beef as influenced by product colour and educational materials. **J. Food Sci. 51**(2); 1986; 253-5, 272

2097 LYNCH (NM), KASTNER (CL), KROPF (DH) and CAUL (JF). Flavour and aroma influences on acceptance of polyvinyl chloride versus vacuum packaged ground beef. **J. Food Sci. 51**(2); 1986; 256-7, 291

2098 LYNCH (NM), KASTNER (CL), CAUL (JF) and KROPF (DH). Flavour profiles of vacuum packaged and polyvinyl chloride packaged ground beef: A comparison of cooked flavour changes occurring during product display. J. Food Sci. 51(2); 1986; 258-62

2099 SEMAN (DL), MOODY (WG), FOX (JD) and GAY (N). Effects of electrical stimulation and hot boning on colour stability of aerobic and vacuum packaged restructured beef steaks. J. **Food Sci. 51**(2); 1986; 268-72

2100 NORTJE (GL), NAUMANN (HD), LAUBSCHER (A), GROBLER (I), NAUDE (L), OOSTHUIZEN (W), JORDAAN (E) and NAUDE (RT). Effects of exercise, electrical stimulation and vacuum packaging on bacterial counts and tenderness of fresh beef primal cuts. J. **Food Prot. 48**(12); 1985; 1036-9

2101 SMITH (LB), FOX (TL) and BUSTA (FF). Comparison of a dry medium culture plate (Petrifilm SM plates) method to the aerobic plate count method for enumeration of mesophilic aerobic colony-forming units in fresh ground beef. J. **Food Prot. 48**(12); 1985; 1044-5

2102 STERN (NJ) and CUSTER (CS). *Salmonella* growth in cooked beef at selected cooling rates. J. **Food Prot. 48**(12); 1985; 1046-9, 1053

Sheep

2103 SMITH (MG). The generation time, lag time, and minimum temperature of growth of coliform organisms on meat, and the implications for codes of practice in abattoirs. J. **Hyg. 94**(3); 1985; 289-300

The growth of coliform organisms on meat tissue from sheep carcasses processed in a commercial abattoir was investigated. Equations were derived relating the generation time and the log time of coliform organisms in raw blended mutton to the temperature at which the meat is held. Estimates of growth obtained with these equations were found to agree closely with the experimental results. KAR

Pork

2104 CORDRAY (JC) and HUFFMAN (DL). Restructured pork from hot processed sow meat: Effect of encapsulated food acids. J. **Food Prot. 48**(11); 1985; 965-8

Pre-rigor sow meat was subjected to four treatments for manufacture of cured, restructured pork. They were (a) control (b) sodium

acid pyrophosphate (SAP) (c) SAP plus encapsulated lactic acid (LA) and (d) SAP plus encapsulated glucono-delta-lactone (GDL). SAP was included in the study because of its ability to catalyse curing reaction. No significant differences were found among treatments for per cent fat ($P < 0.05$). Sensory panels indicated that products from SAP and GDL treatments had more intense flavour ($P < 0.05$) than controls. Objective analysis showed no differences in shear value, tensile strength, water holding capacity, cooked yield or chilled yield. In the GDL treatment, significantly ($P < 0.05$) more of total meat pigment was converted to nitroso-hematin, as compared with controls. MVG

2105 FERNANDEZ-COLL (F) and PIERSON (MD). Enumeration of hydrogen sulphide-production bacteria from anaerobically packaged pork. J. Food Prot. 48(11); 1985; 982-6, 989

Influence of medium composition, pH, incubation time and gaseous atmosphere during incubation on enumeration of $H_2S$ producing bacteria from anaerobically packaged pork was investigated. The optimised recovery and enumeration consisted of pour plating the isolates with lead acetate agar to which 0.003-0.005 % cysteine was added and pH adjusted to 7.5.8.0 plus incubation in an atmosphere of 5 % CO2-95 % $N_2$ for 5 to 6 days at 21 C. MVG

2106 BRACEWELL (AJ), REAGAN (JO), CARPENTER (JA) and BLANKENSHIP (LC). Factors affecting survival of **Campylobacter jejuni** on experimentally inoculated pork skin stored under various conditions. **J. Food Prot.** 48(11); 1985; 944-6

Effects of storage temperature, oxygen concentration and drying on survival of nalidixic acid-resistant strain organism were determined using these treatments. Of the treatments studies, chilling with forced ventilation and storage at 20 C caused significant reductions in numbers of survivors. The results confirm earlier reports that conventional forced ventilation chilling of pork carcasses has the beneficial effect of reducing skin surface **C. jejuni**. MVG

2107 WEAKLEY (DF), McKEITH (FK), BECHTEL (PJ), MARTIN (SE) and THOMAS (DL). Effects of packaging and processing procedures on the quality and shelf life of fresh pork loins. **J. Food Sci.** 51(2); 1986; 281-3

Parchment paper (PP) wrapped and vacuum packaged (VP) pork loin Longissimus musle (20 min post mortem (HP) and 24 hr post mortem (CP) respectively) was stored at 0, 7, 14, 21 or 28 days. VP and HP treatments reduced moisture loss ($P < 0.05$). Off odour scores were higher ($P < 0.05$) in PP loins on 14th day. Few palatability differences were evident with packaging and processing treatments. VP had positive effects on storage and retail display characteristics of fresh pork. MVG

2108 MATTISON (ML), KRAFT (AA), OLSON (DG), WALKER (HW), RUST (RE) and JAMES (DB). Effect of low dose irradiation of pork loins on the microflora, sensory characteristics and fat stability. **J. Food Sci.** 51(2); 1986; 284-7

Low dose irradiation (100 krad) caused reduction in numbers of microorganisms on fresh pork. The beneficial effects became greater as storage time increased beyond 21 days. The low dose irradiation had little effect in attaining chemical or sensory characteristics. MVG

2109 CHOW (H-M), OCKERMAN (HW), CAHILL (VR) and PARRETT (NA). Evaluation of cured, canned pork shoulder tissue produced by electrical stimulation, hot processing and tumbling. J. Food Sci. 51(2); 1986; 288-91

The two way (tumbling time x rigor condition) interaction was significant ($p < 0.05$) for yield with tumbling producing a greater variation in yield in pre-than post-rigor muscle. Utilizing the tum-

bling treatment increased salt soluble proteins ($p < 0.01$), binding strength ($p < 0.01$), cohesiveness ($p < 0.01$), water-holding capacity ($p < 0.01$), Instron tenderness ($p < 0.01$) and a more even distribution of both salt ($p < 0.01$) and sodium nitrite ($p < 0.01$). Pre-rigor muscle treatment improved ham flavour ($p < 0.05$), juiciness ($p < 0.05$) and reflectance of product colour at 570 nm ($P < 0.05$) and 650 nm ($p < 0.06$) when compared to the post-rigor muscle. Electrical stimulation (500 volts) did not alter the quality of canned pork. Aa

Bacon

2110 SHU (C-K) and MOOKHERJEE (BD). Volatile components of the phenolic fraction of cooked bacon. **J. Agric. Food Chem. 33(6);1985; 1107-9**

The volatile components of cooked bacon were isolated via vacuum steam distillation and chemical separation methods. The organoleptically significant phenolic fraction was analyzed, and 43 components were identified, of which five compounds were synthesized for confirmation of structures, including 2,4,5-trimethyl-3(2H)-furanone. AA

2111 TAYLOR (SL) and SOMERS (EB). Evaluation of the antibotulinal effectiveness of nisin in bacon. **J. Food Prot. 48(11); 1985; 949-52**

Nisin in combination with nitrite is an effective antibotulinal treatment for bacon. However, rather high levels of nisin (100 to 150 ppm) are required in combination with 120 ppm nitrite to provide a brief, 1 week extension of shelf life for inoculated bacon incubated at 27 C. This limited antibotulinal effectiveness of nisin in bacon would have little practical value. The limited antibotulinal effectiveness of nisin in bacon was attributed to its insolubility in pickle solutions and its likely slow and incomplete diffusion from the pickle solutions into pork belly tissue. AA

2112 FIDDLER (W), PENSABENE (JW) and GATES (RA). Role of lean tissue on the formation of N-nitrosothiazolidine in raw bacon. **J. Food Sci. 51 (2); 1986; 514-5**

Lean tissue, separated from whole bacon, was found to contain the precursors for N-nitrosothiazolidine (NTHZ), a nitrosamine formed when cured meats are smoked during processing. Of the various treatments investigated, cure incorporation of sodium ascorbate and liquid smoke yielded the lowest NTHZ values. AA

Frankfurters

2113 FOX (JB), Jr. Pin versus disk punch measurements of frankfurter texture. **J. Food Sci. 51(2); 1986; 298-300**

Sausages

2114 SANTOS-BUELGA (C), PENA-EGIDO (MJ) and RIVAS-GONZALO (JC). Changes in tyramine during chorizo-sausage ripening. **J. Food Sci. 51(2); 1986; 518-9, 527**

2115 ROMERO (DA) and McKAY (LL). Isolation and plasmid characterization of a **Lactobacillus** species involved in the manufacture of fermented sausage. **J. Food Prot. 48(!2); 1985; 1028-35**

2116 SEAGER (MS), BANKS (JG), BLACKBURN (CdeW) and BOARD (RG). A taxonomic study of **Staphylococcus** spp. isolated from fermented sausages. **J. Food Sci. 51(2); 1986; 295-7**

Computer assisted numerical analysis was done on 182 characters for each of 107 strains, including 79 Gram-positive, catalase-positive, facultatively anaerobic cocci from 14 different types of fermented sausage offered from retail sale in the UK. The majority of

meat isolates was identified with Staphylococcous xylosus (38%), Saprophyticus (29%) or warneri (10%); eight isolates were left unassigned to a species. The identification matrix derived from these data provided the basis for objective differentiation of isolates from fermented meats. AA

Poultry

2117 SHELDON (BW) and BROWN (AL). Efficacy of ozone as a disinfectant for poultry carcasses and chill water. **J. Food Sci. 51**(2); 1986; 305-9

Microbial counts of ozone treated carcasses stored at 4.4 C were consistently lower than carcasses chilled under nonozonic conditions. More than 99 % of all microorganism washed from carcasses were destroyed by the residual ozone in addition to significant reductions of one third in the chemical oxygen demand and a significant increase in light transmission (500 nm) of treated process water. Ozone contact did not result in any significant carcass skin colour losses, lipid oxidation or off-flavours. MVG

Chickens

2118 RUANTRAKOOL (B) and CHEN (TC). Collagen contents of chicken gizzard and breast meat tissues as affected by cooking methods. **J. Food Sci. 51**(2); 1986; 301-4

Collagen losses in both tissues increased with cooking time or temperature. Percentage acid- and salt-soluble collagen in water cooked gizzard was lower than air pressure cooked gizzard. They were lower in gizzard than in breast meat. Cooking gizzard in boiling water containing 0.5 per cent acetic acid or papain significantly ($P < 0.05$) reduced the collagen content of the tissue. MVG

2119 RYAN (JJ), LIZOTTE (R), SAKUMA (T) and MORI (B). Chlorinated dibenzo-p-dioxins, chlorinated dibenzofurans, and pentachlorophenol in Canadian chicken and pork samples. **J. Agric. Food Chem. 33**(6); 1985; 1021-6

2120 MORRISON (GJ) and FLEET (GH). Reduction of Salmonella on chicken carcasses by immersion treatments. **J. Food Prot. 48**(11); 1985; 939-43

Using a tracer strain of **Salmonella typhimurium** and a direct-counting technique, a procedure was developed for evaluating the effect of immersion treatments on the **Salmonella** contamination of chicken carcasses. Immersion of carcasses in 60 C water for 10 minutes gave 100-fopld reduction in **Salmonella** counts. Addition of 200 ppm chlorine or 2.5% potassium sorbate to the water increased the reductions to 1000-fold with elimination of **Salmonella** from most carcasses. Other immersion treatments were not as effective. Sensory evaluation indicated the acceptability of treated carcasses on the basis of appearance and flavour. AA

2121 JOHNSSON (H), HEDMON (M) and OSTERDAHL (B-G). Residues of coccidiostaticus in chicken. **Var Foda. 38**(3-4); 1986; 263-8 (Swedish)

Quails

2122 LEGARE (ET), BIRRENKOTT (GP) and HALE (KK). The effects of aging, deboning, and brine solutions on Japanese quail (Coturnix coturnix japonica) tenderness and cooked yields. Poult. Sci. 64(10); 1985; 1875-80

Carcasses were aged 2 or 24 hours. Half of all carcasses were deboned prior to aging and the rest after the appropriate aging interval. All samples aged before deboning were significantly more tender than those deboned prior to aging. Addition of 2.5% salt to the aging

solution further increased tenderness and also resulted in better cooked yields. KAR

Turkeys

2123 EHRCKE (LA), RASDALL (JO), GIBBS (SO) and HAYDON (FC). Comparison of eight cooking treatments for energy utilization, product yields, and quality of roasted turkey. **Poult. Sci. 64**(10); 1985; 1881-6

Treatments included two temperature levels in four ovens: conventional electric, microwave, convection and microwave-convection. Findings revealed that the microwave oven, operated at a medium-high energy level registered significantly lower energy utilization than the microwave-convection at the low power setting and the convention oven at 135 C and 190 C. KAR

2124 HAREL (S) and KANNER (J). Hydrogen peroxide generation in ground muscle tissues. **J. Agric. Food Chem. 33**(6); 1985; 1186-8

$H_2O_2$ generation in turkey muscle was determined by using $(^{14}C)$ formate oxidation to $^{14}CO_2$ by the peroxidative activity of catalase. $H_2O_2$ generation was 14.0 nmol/g of fresh weight/30 minutes after incubation of muscle tissues at 37 C. Almost 26.6 nmol of $H_2O_2$ was generated under the same condition in the presence of catalase. Ageing of muscle tissue at 4 C increased the generation of $H_2O_2$. It was suggested that endogenous generation of $H_2O_2$ plays an important role in the fermentation of primary pool of biological catalysts in muscle tissues. MVG

2125 PRUSA (KJ) and KREGEL (KK). Effect of muscle type and sodium tripolyphosphate on residual nitrite, pH, colour, and instron measurements of turkey frankfurters. **Poult. Sci. 64**(11); 1985; 2165-70

Cook yield of turkey frankfurters was not affected by muscle type or phosphate addition. Hunter L-values increased with increasing amounts of white muscle, while Hunter + a values (redness) decreased. Frankfurters made with 100% dark muscle were higher in pH, contained more residual nitrite and had higher cured colour and total colour values than frankfurters made with 100% white muscle. Frankfurters made with 100% white muscle were firmer than frankfurters made wtih with 100% dark muscle. KAR

Eggs

2126 IZAT (AL), GARDNER (FA) and MELLOR (DB). Effects of age of bird and season of the year on egg quality. **Poult. Sci. 64**(10); 1985; 1900-907

2560 eggs from commercial laying hens were examined. Shell thickness was significantly lower in the summer months. Specific gravity was significantly higher in the younger birds and during the cooler seasons. Shell weight increased with increasing age of bird while percentage of shell decreased. During the spring and summer months both shell weight and percentage of shell decreased. KAR

2127 BEVERIDGE (T) and TIMBERS (GE). Small amplitude oscillatory testing (SAOT). Instrumentation development and application to coagulation of egg albumen, whey protein concentrate and beef wiener emulsion. **J. Texture Stud. 16**(4); 1985; 333-49

An instrument to measure the development of protein gels during thermal coagulation was developed. Very small oscillatory movements, sufficiently small to avoid damaging forming structures, were imposed on the sample trapped within a specially constructed cell, and the torques transferred through the sample sensed with strain gauges. Temperatures were controlled with one heating and one refrigerated (20 C) bath and the sample properties determined through both heating and cooling cycles. Egg white (EW) whey protein concentrate (WPC) and beef

wiener emulsion (BWE) were tested. EW and WPC were characterized by delayed onset of gelation followed by high temperature thickening. Cooling further stiffened the gel in both cases. BWE was characterized by an initial decrease in transmitted torque as fat melting was detected. This was followed by a rapid rise in transmitted torque as the protein coagulated, followed by a further increase or stiffening on cooling. Detailed parameters describing the thermal gelation of the three materials are given. AA

2128 WOODWARD (SA) and COTTERILL (OJ). Texture and microstructure of heat-formed egg white gels. **J. Food Sci. 51**(2); 1986; 333-9

Egg white gels were formed by heating liquid egg white at various pH, protein, and NaCl levels at different temperatures and times of heating. Hardness, cohesiveness, and springiness of gels were measured. Serum was expressed from gels and evaluated by polyacrylamide gel electrophoresis. Selected samples were prepared for scanning electron microscopy. Gel hardness rose with increasing temperature, time, pH, and protein level, and decreased with added salt. Cohesiveness and springiness increased with time and temperature of heating. Expressed serum decreased as pH, time, temperature, and protein level were increased. Gels at pH 5 and 6 had a coarse, aggregated structure. At pH 9 protein strands and globules were arranged in a uniform matrix. Salt prompted aggregation of gels. AA

2129 IMAI (C) and SAITO (J). Detection of spoiled eggs using a new-type black light egg inspection unit. **Poult. Sci. 64**(10); 1985; 1891-9

An automatic black light egg inspection unit was examined to evaluate its performance in combination with an automatic candler-type egg inspection unit using fresh and stored eggs. The combined assessment of the black light unit with the candler-type unit rejected 86.2% of heavily contaminated eggs. The combined assessment did not reject eggs contaminated with certain enterobacteriaceae. Combined assessment was found superior to sensory tests. KAR

2130 ACTON (JC), CLAY (DL), ROBINSON (KE), DICK (RL) and ACTON (WC). Structural characteristics of protein gels as determined by an ultrasound imaging technique. **J. Food Sci. 51**(2); 1986; 524-5

Structural density features of gels formed with gelatin, egg albumen, and poultry thigh natural actomyosin were determined with an ultrasound system equipped with a real time monitor, imager and photographic unit. Echo recordings of the acoustic impedance showed that all protein gels were similar in respect to structural density differential patterns. Increases in protein concentration increased the net area occupied by protein junctions and interlinks. The ultrasound imaging technique confirmed the aggregated junction, interlink and interstitial regions that are common features of protein gels. AA

## SEAFOODS

### Fish

2131 CIVO Symposium on "Fish and Health", at Ede (Netherlands), 3rd Oct. 1985, **Voeding. 46**(12); 1985; 381-428 (Dutch)

This issue contains the introductory address, texts of 8 papers, and general summary and conclusions derived from the discussions at the above mentioned symposium. KMD

2132 KROMHOUT (D). Epidemiological data on the occurrence of cardiovascular diseases in relation to fish consumption. **Voeding. 46**(12); 1985; 384-7 (Dutch)

A study of epidemiological data relating to Greenland Eskimos, Japanese, Hawaiian, and Norwegian populations makes it possible to conclude that habitual fish consumption, corresponding to one or two fish dishes per week, may be of value in the prevention of coronary heart disease. KMD

2133 DYERBERG (J). Coronary health aspects of fish food lipids. **Voeding. 46**(12); 1985; 388-91 (Dutch)

A study of the Danish and Eskimo populations has shown that Danes have atleast twice as much arachidonic acid in their blood as the Eskimos, while the Eskimos have a much higher amount of eicosapentanoic acid (derived from fish oils) than the Danes. It is pointed out that polyunsaturated fatty acids from vegetable oils and fish oils are rather different, and have their own particular characteristics and effects. However, there is enough data to recommend an increase in the intake of marine n-3 polyunsaturated fatty acids, for the control of cardio-vascular diseases. KMD

2134 HORNSTRA (G). Influence of a fish- or fish-oil-enriched diet on the risk profile of ischaemic cardio-vascular diseases. **Voeding. 46**(12); 1985; 392-6 (Dutch)

Epidemiological studies clearly indicate that a fish (or fish-oil) rich diet may have a protective effect on the genesis, course, and complications of ischaemic heart disease. A review of the literature makes it clear that a "marine diet" lowers the triglyceride content of blood plasma and prolongs bleeding time. However, results related to plasma cholesterol content, blood pressure and platelet aggregation **in vitro**, and blood coagulation are rather conflicting - probably due to improper experiment design. KMD

2135 KOK (FJ). Influence of selenium on mortality caused by cardio-vascular diseases, in relation to fish consumption. **Voeding. 46**(12); 1985; 397-404 (Dutch)

Selenium is a component of the enzyme glutathione peroxidase which destroys lipid peroxides, and thus protects cells against oxidation. It is presumed that a low selenium status may increase the risk of contracting cardio-vascular diseases, rheumatoid arthritis, and cancer. The results of an epidemiological study in Finland have not helped to decide whether, it is the high selenium content or high oil content (eicosapentanoic acid?) of fish that helps to decrease the risk of cardio-vascular diseases. Se consumption in the Netherlands is estimated at 60-70 µg/day, compared to the daily intake of 150-200 µg Se/day recommended in the U.S.A. The possibility of an inter-relationship between selenium and polyunsaturated fatty acids (including fish lipids) is at present under study. KMD

2136 HULSHOF (KFAM). Fish consumption in the Netherlands. **Voeding. 46**(12); 1985; 405-9 (Dutch)

The fish catch in the Netherlands is sufficient to make available to the population 37 g of round fish/head, or 17 g of edible fish/head, every day, while the average daily fish consumtpion (according to a household survey) was only 8 g/head. Thus, the Dutch population could, with advantage, double its consumption of fish. KMD

2137 LUTEN (JB). Nutritive value of the trace elements from fish, scale fish and shell-fish. **Voeding.** 46(12); 1985; 410-15 (Dutch)

The contents of Cu, Zn, Se, As, Hg, I, Cd and Pb in various types of fish and shell-fish have been reported in the form of a table. Fish products supply less than 2% of the total intake of Cu, Zn, Pb, and Cd in the Dutch diet, about 4 and 7% of the Se and I intake respectively and about 20% of the Hg intake. 90% of the Hg is in the form of methyl mercury. Arsenic is present in fish products in

the form of arseno-betanine which is quickly excreted in the urine. A doubling of fish consumption would be of advantage to the Dutch consumer. KMD

2138 VEERAPPA GOWDA (HS) and KARUNASAGAR (I). Effect of protease inhibitors from **Adenanthera pavonia** on the biochemical and microbiological quality of fishes. **J. Sci. Food Agric. 36**(11); 1985; 1113-9

Fishes were given dip treatment in protease inhibitors extracted from Indian red wood seeds (**Adenanthera pavonia**) and their microbiological and biochemical characters were examined during storage at refrigerator temperatures. The results suggest that protease inhibitors bring about qualitative and quantitative changes in the microflora. Production of trimethylamine (TMA) and volatile bases appeared to be suppressed in the treated fishes. Incorporation of protease inhibitors in broth suppressed such activities as reduction of trimethylamine oxide, production of $H_2S$ and hydrolysis of gelatin in a significant proportion of bacterial cultures. AA

Anchovies

2139 SANTOS-BUELGA (C), MARINE-FONT (A) and RIVAS-GONZALO (JC). Changes of tyramine during storage and spoilage of anchovies. **J. Food Sci.** 51(2); 1986; 512-13, 515

A study was carried out on the evolution of tyramine throughout storage and spoilage at two different temperatures of canned anchovy semi-preserves and anchovy homogenates. During storage, an increase occurred in tyramine until a maximum concentration was reached, after which it began to decrease. The storage temperature did not significantly influence the maximum tyramine content reached, though refrigeration temperatures delayed the start of the increase. Determination of tyramine was not a good parameter for establishing the conservation or spoilage status of anchovies. AA

Catfish

2140 MEDEIROS (LC), DUDLEY (CD) and MEDEIROS (DM). Proximate composition and sensory evaluation of a sausage snack ball made from catfish and from pork. **J. Food sci. 51**(2); 1986; 292-4, 297

Three formulations of a catfish sausage ball product, differing in level of salt and binder, were compared for flavour and texture in a sensory scoring test. No difference in flavour was found among the three variations, but the variation (low added salt, high binder) was found to have a more bready texture. Bready texture was preferable to gummy texture. Catfish based samples were identified from pork samples in triangle test ($P \leq 0.05$). Significant differences were found among variations for moisture ($P \leq 0.01$), protein ($P \leq 0.01$), fat ($P \leq 0.01$), nitrogen free extract ($P \leq 0.01$), and stearic acid ($P \leq 0.05$). No other fatty acid differences were found. AA

Cod

2141 JIANG (S-T), LAN (CC) and TSAO (C-Y). New approach to improve the quality of minced fish products from freeze-thawed cod and mackerel. J. Food Sci. 51(2); 1986; 310-12, 351

Reductants, such as mercaptoethanol, cysteine, tannic acid, sodium bisulphite and ascorbic acid were used in the surimi process to improve the quality of minced fish products. Mercaptoethanol, cysteine and sodium bisulphite at 0.08-0.10 % were most effective in recovering the reactive - SH group and increasing the actomyosin extractability of Kamaboko and frozen cod and mackerel. Reductants generally recovered the reactive SH group and icnreased the gelation of freeze-thawed fish, suggesting that formation of disulphide bond is of importance in

gelation of minced fish products. The addition of oxidants during processing into final product from the surimi with reducing agents made gel strength of product higher than that of samples without oxidant. MVG

2142 VILLEMURE (G), SIMARD (RE) and PICARD (G). Bulk storage of cod fillets and gutted cod (**Gadus morhua**) under carbon dioxide atmosphere. J. Food Sci. 51(2); 1986; 317-20

The storage-life of bulk-stored cod under $CO_2$ atmosphere and air were compared. Gutted fish or fillets were distributed in bulk, among coolers containing 100% air or 25% $CO_2$-75 % $N_2$, which were then stored at 0±1 C for 20 days. Sensory assessments and chemical tests (pH, total volatile nitrogen) were carried out to estimate the raw-state quality and the bacterial spoilage. An important difference was observed between the storage life of cod under carbon dioxide atmosphere and air; microbiological and sensory assessments suggested a storage life exceeding 20 days and total volatile nitrogen results about 6-7 days under gas atmosphere, which was nearly twice as along as in air. Storage in $CO_2$ atmosphere was effective in inhibiting the growth of some bacteria on the fish, thereby contributing to the significant extension of the shelf life of the product. AA

2143 YOWELL (K) and FLURKEY (WH). Effect of freezing and microwave heating on proteins from codfish fillets: Analysis by SDS polyacrylamide gel electrophoresis. J. Food sci. 51(2); 1986; 508-9

Water soluble and insoluble proteins were extracted from codfish samples subjected to a rapid freeze (-196 C), a slow freeze (-15 C), 1 minute microwave heating, and from fresh extracts. The water soluble protein content decreased significantly in both frozen samples and in the microwave heated samples when compared to fresh extracts. Analysis by SDS PAGE showed a significant loss in water soluble proteins after microwave treatment concomittant with the appearance of two high molecular weight species. No differences were apparent in the non-soluble protein SDS PAGE profiles. AA

2144 HAARD (NF). Atlantic a cod gastric protease. Characterization with casein and milk substrate and influence of sepharose immobilization on salt activation, temperature characteristics and milk clotting reaction. J. Food Sci. 51(2); 1986; 313-6, 326

Kinneret bleak

2145 GELMAN (A), BENJAMIN (E) and HERZBERG (A). Production of mince from whole small pelagic fish. Trop. Sci. 25(4); 1985; 253-64

Production of edible material from whole fish avoiding the need for preliminary dressing, could be a feasible solution to the under-utilization of small pelagic fish. Such a process has been developed in the Haifa Fishery Products Laboratory for the processing of the Kinneret bleak (**Mirogrex terrae-sanctae**), a small pelagic cyprinid endemic to Lake Kinneret (Israel), whose commercial size is 10-16 cm (15-30 g). The bleak is fully covered with scales, its bones are relatively hard and thick, and its gall rather big. Using a physical-chemical low-energy method of obtaining a mince-like mass out of the whole bleak, 40-45% of the total weight of the fish was yielded. The proximate composition of this mince as 78% moisture, 18% protein, 3% fat and 1% ash. The whole process takes about 3 h and is performed at temperature ranging from 35 to 45 C. The resulting product is a light-grey, tasteless and odourless paste with no bone fragments present. No bacterial spoilage developed during 7 days storage at 5-6 C, without preservatives. This paste can be used as an addition (up to 50%) in the production of 'gefilte fish', 'fishburgers', fish sausages, hot-dogs and other minced fish foods. AA

Mackerel

2146 AMINULLAH BHUIYAN (AKM), RATNAYAKE (WMN) and ACKMAN (RG). Effect of smoking on the proximate composition of Atlantic mackerel (**Scomber scombrus**). **J. Food Sci.** 51(2); 1986; 327-9

Fall (fat) and spring (lean) Atlantic mackerel (Scomber scombrus L.) were both used in a study of the effects of "hot" smoking on proximate composition. The AFOS-Torry Mini Kiln and the method described in Advisory Note No.82, Torry Research Station, Aberdeen, Scotland were employed. For particular comparisons, both nonsmoked and smoked fish were taken from the same identical catch. The overall process resulted in an approximately 10% loss of protein. This was offset by the moisture loss, twice as much as in the lean fish as in the fatter fish. The much higher fat content in and under the skin of all fish acted as a protective barrier during smoking and helped diminish the moisture loss. The overall process, which included brining, led to an elevation of salt content. AA

Perch

2147 BALABAN (M) and PIGOTT (GM). Shrinkage in fish muscle during drying. **J. Food Sci.** 51(2); 1986; 510-11

Shrinkage of rectangular slabs of ocean perch (**Sebastes marinus**) in all three dimensions during air drying at 24.5 C, relative humdity 35% and velocity 35.6 m/min was determined. Percent change in dimensions with volume fraction of water was measured. It was observed that the dimension along the major axis of muscle fibers (length in this case) shrinks far less than the other two dimensions. Maximum shrinkage in length was 20%, while for width it was 50.5% and for thickness, 50.6%. At 95% confidence level, there was no significant difference between thickness and width shrinkage. AA

Sprats

2148 FALANDYSZ (J). Organochlorine pesticides and polychlorinated biphenyls in sprats from the Southern Baltic, 1983. **Z. Lebensmittel-Unters. Forsch.** 181(6); 1985; 482-5

The mean levels of pesticides found in the muscle tissue of 214 sprats (**Sprattus sprattus**) were as follows: hexachlorobenzene (HCB), 17 µg/kg; $\alpha$-BHC, 33 µg/kg; $\beta$-BHC, 52 µg/kg, $\gamma$-BHC, 33 µg/kg; $\delta$-BHC remained undetected, $\Sigma$ BHC, 120 µg/kg; p,p'-DDE, 110 µg/kg; o,p'-DDD remained undetected; o,p'-DDT, was detected in only 2 of the 214 samples, at a mean level of 24 µg/kg, p,po'-DDD, 94 µg/kg; p,p'-DDT, 115 µg/kg; $\Sigma$ DDT, 320 µg/kg; and PCB 800 µg/kg. These values are 2-3 times greater than the values measured two years earlier. KMD

Trouts

2149 VERBURG (GB) and FREEMAN (DW). Fermentation storage of acid liquefied speckled trout. **Trop. Sci.** 25(3); 1985; 157-63

Whitefish

2150 PELROY (GA), SCHERER (A), PETERSON (ME), PARANJPYE (R) and EKLUND (MW). Inhibition of **Clostridium botulinum** type E toxin formation by potassium chloride and sodium chloride in hot-process (smoked) whitefish (**Coregonus clupeaformis**). **J. Food Prot.** 48(11); 1985; 971-5

Results of the study indicate that substitution of KCl for NaCl in hot-process smoked fish can inhibit the outgrowth and toxin production of **C. botulinum** type E. MVG

Yellowtail

2151 MURATA (M) and SAKAGUCHI (M). Storage of yellowtail (**Seriola quinqueradiata**) white and dark muscles in ice: Changes in content of adenine nucleotides and related compounds. **J. Food Sci. 51**(2); 1986; 321-6

Prawns

2152 KIMURA (S) and TANAKA (H). Partial characterization of muscle collagens from prawns and lobster. **J. Food Sci. 51**(2); 1986; 330-32, 339

The abdominal muscle tissues of giant river prawn, fleshy prawn and spiny lobster contained 2.4-2.6% collagen of the total tissue protein. Alkali-insoluble proteins were prepared from the muscle tissues by treatment with 0.1N NaOH at 4 C and found to exhibit the amino acid composition typical of collagen. The muscle collagens, consisting of chain-sized components, were then isolated by limited pepsin digestion and characterized by a high content of hydroxylysine and its glycoside and a low content of alanine. In addition, subcuticular membranes covering the muscle tissues were found to be comprised mainly of such an alkali-insolube collagen. AA

2153 GREENWOOD (MH), COETZEE (EFC), FORD (BM), GILL (P), HOOPER (WL), MATTHEWS (SCW) and PATRICK (S). The microbiology of cooked prawns and shrimps on retail sale. **J. Hyg. 94**(3); 1985; 319-26

In an inter-laboratory survey, 148 samples of cooked prawns and shrimps were obtained at the point of sale to the consumer. Salmonellae and **Vibrio parahaemolyticus** were not detected. **Yersinia enterocolitica** was isolated from three samples. Results for total viable count and presence of **Escherichia coli** and **Staphylococcus aureus** complied well with available guidelines for imported cooked prawns, suggesting that the risk of food poisoning from retail samples of these foods in the South of England is minimal. AA

2154 PAPADOPOULOS (LS) and FINNE (G). Effects of gradual and acute changes in salinity on the moisture, salt, and free amino acid content in the tail muscle of brown shrimp (**Penaeus aztecus**). **J. Agric. Food Chem. 33**(6); 1985; 1174-7

The relationship between free amino acid concentration, salt and moisture content in shrimp subjected to both gradual and acute changes in environmental salinity has been studied. MVG

## PROTEIN FOODS

2155 JONES (AOL), FOX (MRS) and FRY (BE) Jr. **In vitro** assessment of zinc binding to protein foods as a potential index of zinc bioavailability. Comparison of **in vitro** and **in vivo** data. **J. Agric. Food Chem. 33**(6); 1985; 1123-8

Strength of zinc binding was estimated by an **in vitro** equilibrium dialysis test in sov flour, soy concentrate, casein and dried egg white labeled with $^{65}ZnCl_2$. The dialysis was carried out for 24 hours at pH 7.4 against M tris (hydroxymethyl) aminomethane buffer (Tris), Tris plus 0.01 M L-histidine hydrochloride (Tris-His) and Tris plus 0.01 M $Na_2$ EDTA (Tris-EDTA). Results showed that $^{65}Zn$ was retained by the protein foods studied in the following decreasing order according to treatment: Tris > Tris-His > Tris-EDTA. The bioavailability of residual $^{65}Zn$ was determined after each buffer treatment by giving single doses of the protein foods to young Japanese quail. The best agreement between **in vitro** and **in vivo** data was with Tris-His-dialysable $^{65}Zn$ values and the whole body $^{65}Zn$ retention was obtained

from labeled untreated casein and egg white. It was suggested that the in vitro test could be useful for preliminary assessment of Zn bioavailability in protein foods. MVG

2156 ROWLEY (BO) and RICHARDSON (T). Protein-lipid interactions in concentrated infant formula. **J. Dairy Sci. 68**(12); 1985; 3180-8

Radiolabeled tracer and chemical studies have shown that in the range of 0-8 meq/L of KCl added to infant formula after homogenization, but before sterilization, the lipid layer content of carbon -14 from [carbon-14] k casein in the sterilized product decreased by 4.7% for each/meq/L of added KOH. For each 1 meq/L of KOH, lipid larger content of protein decreased by 2 g/L (out of the total 32 g/L). BSN

2157 AKMAL KHAN (M) and KISSANA (AS). Nutritional evaluation of some commercial baby foods consumed in Pakistan. **J. Sci. Food Agric. 36**(12); 1985; 1271-4

The protein content of milk foods and cereal milk blends ranged from 13.3-26.0 and 11.1-13.2% respectively. Fat content varied from 27-31%. Available carbohydrates in milk based formulas were lower (44.1-59.9%) than cereal-milk blend (71.5-77.7%). Oster milk contained highest (5.6%) ash. The NPU values in milk based formulas varied between 0.68 and 0.75 and NPU of cereal milk blends ranged from 0.69 to 0.71. KAR

## FRUIT JUICES AND BEVERAGES

2158 HAYASHI (T) and SHIBAMOTO (T). Analysis of methyl glycoxal in foods and beverages. **J. Agric. Food Chem. 33**(6); 1985; 1090-93

Traces of methyl glyoxol, a mutagen, were studied by a new method. The method involves reaction of methyl glyoxol with cysteamine to give 2-acetylthiazolidine in a food or beverage sample at pH 6. 2-acetylthiazolidine formed was extracted with dichloromethane and analysed by gas chromatography using fused silica capillary column and thermoionic detector. In the 17 commercial items examined, the quantities of methyl glyoxol ranged from 0.04 (orange juice) to 47 ppm (decaffeinated brewed coffee). MVG

2159 LITTEL (KJ) and LaROCCO (KA). Bioluminescent standard curves for quantitative deteremination of yeast contaminants in carbonated beverages. **J. Food Prot. 48**(12); 1985; 1022-4

A method for construction of standard curves relating yeast ATP to conventional yeast colony forming units (CFU) has been developed. Data demonstrating the utility of the standard curve in predicting CFUs by ATP measurement is also presented. MVG

2160 LITTEL (KJ) and LaROCCO (KA). ATP screening method for presumptive detection of microbiologically contaminated carbonated beverages. **J. Food Sci. 51**(2); 1986; 474-6

A rapid adenosine triphosphate (ATP) screening method utilizing a vacuum-filtration procedure was developed for the presumptive detection of yeast and mold contamination in carbonated beverages. First, a baseline of ATP content was established by examining 240 retail cola samples that did not contain detectable microorganisms. Then an additional 182 retail samples were assayed for ATP and Colony Forming Units (CFU). Of these, less than 3% were presumptive-positive by the ATP method. All 182 samples were microbiologically negative for yeast. When 140 cola samples were spiked with various yeast types, more than 89% of samples were correctly identified as presumptive-positive at an arbitrary product specification level of 5 CFU/mL. AA

Apple juices

2161 BEVERIDGE (T), FRANZ (K) and HARRISON (JE). Clarified natural apple juice: Production and storage stability of juice and concentrate. J. Food Sci. 51(2); 1986; 411-5, 433

Thermal treatment (90 C, 20 seconds) of Red Delicious apple mashes followed by Pectinase (0.02%; v/w), centrifugation, bentoniting and filtration resulted in a clear natural apple juice. Whole apple mash juice was faintly pink due to extracted skin anthocyanins and the 70 Brix concentrate prepared from the juice was ruby red. Pink juice browned extensively over 648 hours storage at 37 C and browning was associated with development of an absorption maximum at 446 nm. The ruby red concentrate stored at 37 C, turned orange (167 hours) darkening to brown (648 hours) and gave visible spectral scan typical of Maillard browning development. AA

2162 RIET (WB Van Der) and WALT (WH Van Der). Effect of ionizing radiation on ascospores of three strains of **Byssochlamys fulva** in apple juice. J. Food Prot. 48(12); 1985; 1016-8

Radiation inactivation of the ascospores of three strains (M 68-79), NRRL 1125 and NRRL 2614) of the heat resistant mold **Byssochlamys fulva** suspended in apple juice, was investigated. Whereas the ascospores of strain M 68-79 were significantly more sensitive to ionizing radiation, those of strains NRRL 1125 and NRRL 2614 did not differ significantly from one another in this respect. High numbers of ascospores of the more resistant strains required an absorbed dose of approximately 7.2 kGy (95% confidence interval 6.7 to 7.9 kGy) for inactivation, a decimal reduction dose (D10) of approximately 1.2 kGy was estimated for these strains. Ascospores of strain NRRL 2614 were confirmed as more radiation resistant when a small proportion survived an absorbed dose of 5 kGy and spoiled apple juice within a 3-month storage period. Although it was possible to inactivate **B. fulva** ascospores at absorbed doses of < 10 kGy, it is probable that flavour impairment of apple juice, as well as cost currently limit the feasibility of this process. AA

Crowberry juices

2163 KALLIO (H), PALLASAHO (S), KARPPA (J) and LINKO (RR). Comparison of the half-lives of the anthocyanins in the juice of crowberry, **Empetrum nigrum**. J. Food Sci. 51(2); 1986; 408-10, 430

The half-lives of the 12 anthocyanins of crowberry juice have been compared by varying the contents of oxygen, ascorbic acid, $_{Al}{}^{3+}$ and $_{Fe}{}^{3+}$ ions. MVG

Grapefruit juices

2164 BARMORE (CR), FISHER (JF), FELLERS (PJ) and ROUSEFF (RL). Reduction of bitterness and tartness in grapefruit juice with florisil. J. Food Sci. 51(2); 1986; 415-6, 439

Treatment of commercial grapefruit juice with Florisil (activated magnesium silicate) simultaneously reduced the content of citric acid and the bitter compounds limonin and naringin. Ascorbic acid concentration and Brix (total soluble solids) were not altered by the Florisil treatment. Experienced taste panelists were able to differentiate between the nontrated and Florisil-treated juice on the basis of bitterness and tartness (acidity). The panelists indicated a preference for the Florisil-treated juice. AA

2165 FELLERS (PJ), de JAGER (G), POOLE (MJ), HILL (EC) and MITTAL (P). Quality of Florida-packed retail grapefruit juices as determined by consumer sensory panels and chemical and physical analyses. J. Food

Sci. 51(2); 1986; 417-20

Six samples of each of 5 types of Florida-processed grapefruit juice obtained from the U.S. retail market during 1983 were evaluated for overall flavour and other quality attributes by 108-member consumer sensory panels. Grapefruit juice consumers found overall flavour acceptable and colour about right, aroma and sweetness lacking ($P < 0.01$) and tartness and bitterness excessive ($P < 0.01$). Juices were measured for content of furfural, naringin, limonin, brix and acid with Brix;acid ratio being calculated. Most factors varied according to type of product. Many correlation coefficients, although mostly low, were found significant between factors ($P < 0.05$). Panelists perceived bitterness to a measurable extent as tartness or lack of sweetness and did not clearly differentiate between these two sensory attributes. AA

Marula juices

2166 PRETORIUS (V), ROHWER (E), RAPP (A), HOLTZHAUSEN (C) and MANDERY (H). Volatile flavour components of Marula juice. Z. Lebensmittel Unters. Forsch. 181(6); 1985; 458-61

The volatile aromatics of marula fruit picked in the Republic of South Africa were enriched by means of an established liquid-liquid extraction technique. GC and GC-MS analyses were employed to identify 60 components with Kovats Indices lower than 2,000 (CW 20M). Sesquiterpene hydrocarbons formed the most abundant group of compounds, with β-caryophyllene being the major constituent of all analyzed samples. 33 sesquiterpene hydrocarbons could be detected of which 22 were identified, including all major components. Significant differences between the analyzed samples were observed only within the sesquiterpene fraction - Odour assessment indicated the absence of compounds with impact character. AA

Orange juices

2167 KAUSCHUS (U) and THIER (H-P). The composition of soluble polysaccharides in fruit juices. II. Other juices. Z. Lebensmittel Unters Forsch. 181(6); 1985; 462-6 (German)

The analytical procedure described for orange juice in part I has been applied for determining the composition of soluble polysaccharides in fruit juices (apple, grape, maracuja, pineapple), fruit purees (apricot, black and red currant, peach) and concentrated fruit juices (black and red currant, sour cherry). The polysaccharides were composed of the same sugar and uronic acid units, but showed characteristic differences in the percentages according to the kind of fruit and the processing conditions. Also, the pattern of juice components in the fraction which is non fermentable by baker's yeast showed that quinic acid, aldoheptuloses, and an elevated content of inositol will indicate the presence of orange juice in maracuja juice. AA

2168 RODRIGO (MI), MALLENT (D) and CASAS (A). Relationship between the acid and limonin content of Washington Navel orange juices. J. Sci. Food Agric. 36(11); 1985; 1125-9

Juice samples of Washington Navel oranges from three groves were analysed for limonin, Brix and acid during several seasons. A strong correlation between limonin and acid content has been found. AA

Cocoa

2169 NEY (KH) and BERNHAUER (H). Cacao aroma - preparation of aliphatic α-keto acids and α-amino acids by a Van Slyke reaction, followed by a permanganate oxidation as well as by enzymatic reactions. Gordian. 85(6); 1985; 119-20 (German)

α-keto acids have been prepared from α-amino acids both chemically and enzymatically. First, the α-amino acids were converted to the corresponding α-hydroxyacids by a Van Slyke reaction. The latter were then oxidized by means of potassium permanganate, at a basic pH-value, to the corresponding α-keto-acids. The products so obtained were chromatographically pure. The enzyme, D-amino acidoxydase, obtained from pig kidney, was used to oxidize D,L-leucine to α-keto-isocapranoic acid, D,L-valine to α-keto-isovalerianic acid, and D,L-methionine to α-keto-thiomethylbutyric acid, in gram quantities. The advantages and disadvantages of the enzymatic synthesis of -keto acids have been discussed. KMD

Coffee

2170 LERICI (CR), DALLA ROSA (M) and PIVA (M). Production of roasted coffee with high yield. 1. Roasting trials. **Ind. Aliment. 24(12)**; 1985; 991-4, 1000 (Italian)

A roasted coffee with high yield differs from the coffee roasted in drums, in the traditional manner, in that it has a lesser density. An investigation has been carried out to determine the roasting conditions that would result in the maximum increase in volume and loss in weights of the coffee seeds. The best results were achieved by a high-temperature, short-time heating (230 C for 1-2 minutes). A continuous, coffee roasting machine has been designed. KMD

2171 LECLERCQ (E) and NETJES (JJ). Release of sesquiterpene lactones by enzymatic liquefaction of chicory roots. **Z. Lebensmittel. Unters. Forsch. 181(6)**; 1985; 475-7

The release of lactucin, 8-deoxylactucin and lactucopicrin, all sesquiterpene lactones, which are bitter constituents of chicory, has been studied during enzymatic liquefaction of chicory roots with commercial pectolytic and celluolytic enzymes at 40 C for 24 hour. After 5-8 hour most of these bitter compounds are found in the liquid phase (supernatant) and not in the sediment (residue), except for lactucopicrin, which is hardly soluble in aqueous solution. AA

2172 MARX (F), PFEILSTICKER (K) and SOARES MAIA (JG). Analysing Guarana (**Paulinia cupana** var. Sorbilis). Part. 1. HPLC determination of caffeine, theobromine and theophylline in Guarana seeds. **Dtsch. Lebensmittel-Rundschau. 81(12)**; 1985; 390-92 (German)

Samples of air-dried and roasted seeds of guarana (harvested in 1984) as well as 2 trade samples, all from the Amazon region, were investigated for their content of caffeine, theobromine and theophylline with the aid of reversed phase HPLC. Contents of 3.6-5.8% of caffeine, 0.03-0.17% of theobromine and 0.02-0.06% of theophylline (related to dry matter) were found. The relation of caffeine/theophylline differs between 100:0.5 and 100:1.6 and can be used to distinguish guarana from coffee, cola and mate when added to drinks. AA

Tea

2173 MAHANTA (PK), HAZARIKA (M) and TAKEO (T). Flavour volatiles and lipids in various components of tea shoots **Camellia sinensis** (L.), O. Kuntze. **J. Sci. Food Agric. 36(11)**; 1985; 1130-32

The gradual enrichment of volatile flavour components (VFC) in CTC (crush, tear, curl) black teas obtained from various shoot components of clone TV-17 such as the bud, first, second and third leaf has been attributed to the higher accumulation of lipids in the more mature leaf. Stem, as a low accumulator of lipid, may be responsible for low amounts of VFC. AA

2174 PRICE (WE) and SPIRO (M). Kinetics and equilibria of tea infusion: Theaflavin and caffeine concentrations and partition constants in several whole teas and sieved fractions. J. Sci. Food Agric. 36(12); 1985; 1303-8

Concentrations of theaflavin and caffeine were determined in whole Kapchorua Pekoe Fannings and in six of its sieved fractions, as well as in Kapchorua Pekoe Dust, Betjan Flowery Broken Orange Pekoe and Rupai Flowery Orange Fannings and in one sieved fraction of each. The partition constants of theaflavin and caffeine between these leaves and water at 80 C were also determined. Neither property varied significantly with leaf size but did depend on leaf origin and manufacture. The concentration and partition constants for caffeine were greater than for theaflavin. As a corollary, the ratio of caffeine to theaflavin is larger in tea initially drawn from the teapot than in the beverage prepared after topping up with fresh hot water. AA

2175 PRICE (WE) and SPIRO (M). Kinetics and equilibria of tea infusion: Rates of extraction of theaflavin, caffeine and theobromine from several whole teas and sieved fractions. J. Sci. Food Agric. 36(12); 1985; 1309-14

The rates of infusion of theaflavin and caffeine into water at 80 C have been measured for Kapchorua Pekoe Fannings, Kapchorua Pekoe Dust, Betjan Flowery Broken Orange Pekoe and Rupai Flowery Orange Fannings whole teas and sieved fractions. For Kapchorua PF fractions the rates of theobromine infusion were also determined. Caffeine always infused faster than theobromine, and both infused faster than theaflavin. Rate constants were obtained from the slopes of first order kinetic plots which yielded straight lines with small intercepts. The rate constants for all three consituents increased by a factor of 2.2 as leaf size decreased from 850-1000 μm to 500-600 μm. The rates of extraction from whole teas varied more than fourfold. Kapchorua PD gave the most rapid rates and Betjan FBOP the slowest. Comparisons of similarly sized fractions of teas showed that leaf size distributions accounted for half these differences and the intrinsic properties of the leaf for the remaining factor of two. The Kenyan CTC teas gave higher rate constants than the Indian orthodox teas. From the rate constants, the effective diffusion coefficients for theaflavin and caffeine in Betjan FBOP leaf were calculated and found to be some 100 times smaller than in water. This shows the diffusion processes within the leaf to be complex ones. AA

2176 MAHANTA (PK) and HAZARIKA (M). Chlorophylls and degradation products in orthodox and CTC black teas and their influence of shade of colour and sensory quality in relation to thearubigins. J. Sci. Food Agric. 36(11); 1985; 1133-9

Chlorophylls and concomitant pigments along with catechins were analysed in shoots from various Tocklai released clones with pronounced genetic variation and in the corresponding orthodox black teas. Comparison of these values with tasters' score showed that the shade of colour of an orthodox black tea is influenced mostly by pheophytin and thearubigins. The degradation of chlorophyll into pheophytin and pheophorbide was also studied in orthoxol and crush-tear-curl (CTC) teas. The observations indicated that both pheophytin and pheophorbide are always higher in orthodox than in CTC teas made from the same leaf source. AA

2177 CETINKAYA (M) and THIEMANN (W). Residue analysis of non-volatile organochlor compounds in black tea. Dtsch. Lebensmittel-Rundschau. 81(12); 1985; 393-5 (German)

Organochloropesticides in black tea originating from Turkey, Peoples Republic of China, Sri Lanka, India and the USSR were investigated. The analysis method consists of an extraction of the tea with

petrol-ether/acetone in a soxhlet and a purification of the extract with petrol-ether/dichloromethane over florisil/silica gel. The organochlorocompounds are quantitatively identified by gas chromatography. The recovery rate of the method amounts to 95.4 ± 9.24%. AA

Alcoholic beverages

2178 YAVAS (I) and RAPP (A). On the quantitative determination of anethole and volatile aromatic substances in various rakee samples. Dtsch. **Lebensmittel-Rundsch. 81(10)**; 1985; 317-21 (German)

Rakee, the most popular alcoholic beverage in Turkey, is obtained by first extracting a mixture of aniseed and other species with a distilled alcohol, and then distilling the alcoholic extract once again. Such brandies are also called "ouzo" and "mestika" in Greece, and "Pastis" or "Pernod®" in France. Twleve volatile components have been identified in rakee samples; their standard deviation is between 2.0 and 8.3%. The anethole content of rakee varied between 260 and 343 mg/100 ml; it was highest in Pernod (480 mg/100 ml) and lowest in ouzo (92 mg/100 ml). KMD

Beer

2179 PEPPARD (TL). Development of routine investigational tools for the study of sulphury flavours in beer. J. **Inst. Brew. 91(6)**; 1985; 364-9

Discusses: Descriptive flavour analysis, and instrumental analysis of organoleptic volatiles. BSN

2180 BAMFORTH (CW). The foaming properties of beer. J. Inst. Brew. 91(6); 1985; 370-83

Discusses: Physics of foaming; measurement of beer foam; beer composition and foaming; and foam lacing. BSN

2181 HINCHLIFFE (E). β-glucanase: The successful application of genetic engineering. **J. Inst. Brew. 91(6)**; 1985; 384-9

Discusses: Genetics with a brewing perspective; effects of β-glucan on wort and beer; identification of β-glucanase gene donor; isolation of a **B. subtilis** β-glucanase gene; molecular nature of the **B. subtilis** β-glucanase gene; expression of the **B. subtilis** β-glucanase on beer fermentation and considerations for brewing yeast strain construction; and future construction of β-glucanase producing brewing yeast. BSN

2182 OGDEN (K) and TUBB (RS). Inhibition of beer-spoilage lactic acid bacteria by nisin. **J. Inst. Brew. 91(6)**; 1985; 390-92

149 strains of bacteria, mostly brewery contaminants able to spoil wort or beer, and 12 brewing strains of yeast (8 ale and 4 lager strains) have been screened using a well-test assay for sensitivity to the food preservative, Nisin (E234), Nisin inhibited growth of 92% of the gram-positive strains, predominantly lactic acid bacteria of the general **Lactobacillus** and **Pediococcus.**, In contrast, all 32 gram-negative strains tested, except 3 **Flavobacter** strains, were Nisin-resistant; in addition none of the brewing yeasts showed Nisin-sensitivity. Therefore, Nisin has potential applications in preventing spoilage of worts or beers by lactic acid bacteria. AA

Malt

2183 HENRY (RJ). Evaluation of barley and malt quality using near-infrared reflectance techniques. J. **Inst. Brew. 91(6)**; 1985; 393-6

A scanning near-infrared reflectance spectrophotometer was calibrated for the prediction of barley aleurone colour and malt moisture. The malt moisture was predicted on malt ground for the

determination of malt extract (coarse grind) making the method suitable for moisture correlation in malt extract estimation. Calibrations for the prediction of malt extract and endosperm modification from barley and malt were also attempted. A correlation (r=0.851 n=135) was found between malt hot water extract and the percentage of the endosperm estimated as being modified by microscopy following staining with Calcofluor. Probably because of this influence of modification on malt extract, the use of near-infrared reflectance to predict malt extract was most successful at predicting the malt extract values obtained following micro-malting in the absence of the additives, gibberellic acid and potasium bromate. AA

Wort

2184 GIBSON (RM), LARGE (PJ) and BAMFORTH (CW)., The use of radioactive labelling to demonstrate the production of dimethyl sulphide from dimethyl sulphoxide during fermentation of wort. **J. Inst. Brew.** 91(6); 1985; 397-400

Yeast reduced during fermentation $^{(14}C)$ dimethyl sulphoxide (DMSO) to radioactive dimethyl sulphide (DMS) even under brewing conditions under which DMS formation could not be explained by GLC analysis. However, during fermentation of Lager worts at 8 C, DMS production was confirmed. BSN

2185 GIBSON (RM), LARGE (PJ) and BAMFORTH (CW). The influence of assimilable nitrogen compounds in wort on the ability of yeast to reduce dimethyl sulphoxide. **J. Inst. Brew.** 91(6); 1985; 401-5

Dimethyl sulphoxide (DMSO) reductase activity increased at the end of the growth cycle of **Saccharomyces cerevisiae** NCYC 240 on complex medium. On defined medium, DMSO reeductase and thioredoxin reductase activities and thioredoxin were all elevated in cultures limiting in nitrogen, but not in nitrogen-sufficient cultures. In nitorgen limiting cultures it was also shown that the reduction of DMSO (measured as disappearance of $^{(14}C)^{--}$ from the medium) was much increased compared with conditions of nitrogen excess. This applied whether ammonium or glutamate was the limiting nitrogen source. When methionine was used as the limiting nitrogen source, DMSO reduction was higher still. Methionine-limited cells accumulated [$^{17}$C] methionine much more rapidly than did cells from methionine-sufficient cultures, and [$^{14}$C] methionine sulphoxide could be identified in the cells after 1 minute incubation with labelled methionine. It is concluded that DMSO reductase activity is controlled by nitrogen catabolite repression and may be involved in methionine uptake by yeast. The amino nitrogen content of wort will in consequence have an important effect on levels of dimethylsulphide (DMS) produced during fermentation. AA

Wine

2186 INTERESSE (FS), D'AVELLA (G), ALLOGGIO (V) and LAMPARELLI (F). Mineral contents of some Southern Italian wines II. Determination of Li, Na, Mg, K, Ca, Co, As, Rb, Sr, Ag, Sb, Ba. **Z. Lebensmittel Unters. Forsch.** 181(6); 1985; 470-74

Following our study of the mineral contents of some Southern Italian wines, this work reports on the detection of 12 elemental components. The elements were determined using ICP-AES, flame atomic emission or absorption spectroscopy. The values determined for Li, Na, Mg, K, Ca, Rb, Sr and Ba were within the usual ranges for wines (average values for these elements were: 0.010, 26.2; 94.4; 888; 94.0; 3.30, 0.82 and 0.11 mg/l respectively. All the wines contained low levels of As, the concentrations of which were always under 0.20 mg/l, the maximum level permitted by E.E.C. standards. The measuring of Co,

Ag, and Sb led us to ascertain, in all the wines. concentrations lower than 0.01 mg/l for Co and Ag and below the instrumental detection level for Sb (0.06 mg/l). AA

2187 FUHRLING (D), WOLLENBERG (H) and LITTMANN (S). Part II. On the determination of small amounts of diethylene glycol in wine. I and II. Dtsch. Lebensmittel-Rundsch. 81(10); 1985; 325-9 (German)

In view of the recent adulteration of wine with diethylene glycol, the authors have tried to point out some new possibilities for the analysis (i.e. detection and estimation) of diethylene glycol in wine. In the first method (Part I) wine with a sugar content ⩾ (20 g/l) is first fermented with yeast to bring the sugar content below 120 g/l; it is and then passed through an ion-exchange column to remove anionic and cationic compounds. This pre-treated wine is then passed over kieselgur-gel and extracted with acetone. The extract is freed from solvent, derivatized by an silylating agent, and examined by capillary chromatography. In the second method (Part II) diethylene glycol is separated by column chromatography, and then determined by gas chromatography, without prior derivatisation. KMD

2188 MMEGWA (SVA), BALOGH (E) and NGODDY (PO). Formulated palm wine: Sensory evaluation and its use in palm wine extension. Trop. Sci. 25(4); 1985; 271-81

Palm wine was simulated by preparing a 12% sugar solution containing 0.1% di-ammonium hydrogen phosphate and 0.01% yeast extract, and inoculating with natural palm wine flora. The resulting brew (termed formulated palm wine),as well as its various blends with natural palm wine (termed extended palm wine), passed for palm wine is subsequent sensory evaluation tests. The development of the product is seen as the first step towards the possible establishment of palm wine breweries, that is large-scale **in vitro** preparation of palm wine. AA

2189 BAKKER (J) and TIMBERLAKE (CF). The distribution and content of anthocyanin in young port wines as determined by high performance liquid chromatography. **J. Sci. Food Agric.** 36(10); 1985; 1325-33

The paper describes the distribution and content of anthocyanins in young port wines made in three successive years (1981-83) from up to sixteen grape cultivars grown at five different sites in the Douro valley in Northern Portugal. KAR

## OILS AND FATS

### Conophor

2190 EKPENYONG (TE). Protein extraction from conophor (**Tetracarpidium conophorum**) seed. **J. Food Sci.** 51(2); 1986; 538-9

### Madhuca

2191 SHANMUGASUNDARAM (T) and VENKATARAMAN (LV). Effect of ethanol treatment on the proteins of madhuca (**Madhuca butyraceae**) seed flour. J. Sci. Food Agric. 36(11); 1183-8

**Madhuca butyraceae** flour was subjected to a two stage ethanol treatment to remove the toxic saponins and the effect of such treatment on the proteins was determined. Ethanol treatment caused minor changes in the amino acids composition and also in the gel filtration and gel electrophoretic patterns. The limiting amino acids in the ethanol treated flour are lysine and sulphur containing amino acids as compared to the provisional amino acid scoring pattern of FAO/WHO. AA

2192 SHANMUGASUNDARAM (T) and VENKATARAMAN (LV). Nutritional evaluation of ethanol extracted madhuca (**Madhuca butyraceae**) seed flour. J. Sci. Food Agric. 36(11); 1985; 1189-92

Defatted madhuca flour is toxic due to the presence of saponins. Alcohol, 20-95%, was used to remove the saponins and it was found that two stage 60% ethanol extraction removed 90% of the saponins present in the flour. Rat feeding trials using the ethanol extracted flour at 10 and 15% protein levels yielded PER of 0.8 and 1.5 respectively and did not show any ill effects other than minor cytoplasmic vacuolation in liver and kidney in histological studies. AA

Fats

2193 ARENS (M) and KROLL (E). Survey by a working party of the DGF, 92th Report: German standard methods for investigation of fats, fatty products and related materials 69th Report: Analysis of Fats. XXI. **Fette Seifen Anstrichm.** 87(12); 1985; 467-71 (German)

2194 BHATTACHARYYA (DK), CHAKRABARTY (MM) and KAR (K). Studies on nutritional quality of interesterified fat products. **Fette Seifen Anstrichm.** 87(12); 1985; 486-9

The nutritional quality of the fat products with melting range 36 to 37 C having been prepared from non-traditional oils like mowrah (**Madhuca latifolia**), rice bran (**Oryza sativa**) containing sal (**Shorea robusta**) and cottonseed (**Gossypium hirsutum**) mixed with sal by interesterification (randomisation) were examined with rats and compared with that of "Vanaspati", produced by hydrogenation of mixtures of liquid oils and used exclusively as a substitute of ghee (butter fat) in India. The average food intake, body weight gain, food efficiency ratio, weight of different organs, total lipid content of serum, liver, heart and kidney were similar in all the cases. Serum triglyceride levels were quite low in case of interesterified fats fed rats though total and free cholesterol levels were not significantly different. Serum phospholipid levels were slightly higher in case of the interesterified fats fed rats. Total and free cholesterol, phospholipid and triglyceride content of liver, kidney and heart were similar for the four dietary groups of rats. Serum lipids and liver lipids contain more polunsaturated fatty acids when rats were raised on various interesterified fats in place of hydrogenated fat product "Vanaspati". AA

2195 NASNER (A). Antioxidizing properties of lecithin. **Fette Seifen Anstrichm.** 87(12); 1985; 477-81 (German)

In various storage trials with sunflower oil and lard the antioxidizing properties of crude soybean lecithin as well as of its alcohol soluble and alcohol insoluble fraction could be proved. The addition, of a very small quantity of these phospholipids to the oil after the refining process (prior to this process crude oil contains approximately 2-3% lecithin) improves the stability of these oils. The antioxidizing properties of phospholipids depend on: 1. composition of phospholipids, 2. tocopherol content of the oil. In our trails the alcohol soluble fraction of soybean lecithin performed the best antioxidizing results in sunflower oil by adding not less than 1%. In lard, the same effect could already be reached with 0.1% of this fraction. As shown before, lecithin with a special phospholipid composition has antioxidizing properties and its addition in small quantities is beneficial to increase the stability of oils and fats. In new Japanese literature, soybean saponins are the most favoured antioxidizing agents. Our trials did not confirm the results of these publications. AA

## SPICES AND CONDIMENTS

### Chillies

2196 CHIANG (GH). HPLC analysis of capsaicins and simultaneous determination of capsaicins and piperine by HPLC-ECD and UV. **J. Food Sci.** 51(2); 1986; 499-503

A highly sensitive liquid chromatographic procedure with electrochemical detection (ECD) was developed to separate and quantitate major capsaicins, the pungent principles of red and green pepper. Although complete chromatographic separation of capsaicins from piperines was not achieved, electrochemical (EC) monitoring at 0.4V applied potential detected only the electrochemical (EC) monitoring at 0.4V applied potential detected only the electroactive capsaicins. Ultraviolet (UV) monitoring at 340 nm detected only the strongly absorbing piperine. Thus, simultaneous determination of capsaicins and piperine were achieved by the applications of both EC and UV detections. AA

## SENSORY EVALUATION

2197 BURNS (DJW) and NOBLE (AC). Evaluation of the separate contributions of viscosity and sweetness of sucrose to perceived viscosity, sweetness and bitterness of vermouth. **J. Texture Stud.** 16(4); 1985; 365-81

2198 MONTEJANO (JG), HAMANN (DD) and LANIER (TC). Comparison of two instrumental methods with sensory texture of protein gels. **J. Texture Stud.** 16(4); 1985; 403-24

The textural attributes of 8 different heat-induced protein gel preparations evaluated by torsion failure testing and Instron texture profile analysis (TPA) were compared to sensory ratings by a trained texture profile panel. The gels presented a wide range of textural properties as determined by the instrumental and sensory parameters. Among the instrumental parameters, true shear strain at failure was the most frequent and significant predictor of sensory notes. Initial shear modulus and 50% compression force had the poorest correlations with sensory notes. Comparison of the two instrumental tests produced high correlations between shear stress at failure and TPA hardness; true shear strain at failure and TPA cohesiveness; and, initial shear modulus and 50% compression force. High correlations were also observed among various panel notes. Canonical correlation analyses showed that sets of linear combinations of parameters from each one of the 3 tests (torsion, TPA or sensory) were highly correlated to sets from either of the other two. Regression equations relating each of the instrumental tests to sensory notes were developed. Of the torsion failure parameters, the logarithm of true shear strain most commonly appeared in the equations. Of the TPA parameters, cohesiveness and its logarithm were the terms that were most frequent. High $_R^2$ values were obtained from regression equations developed for predicting torsion failure parameters based on TPA parameters. AA

2199 SCHWENKE (KD), PRAHL (L), NOACK (J) and BRAUDO (EE). Gelation of casein after modification by dialdehyde starch-chemical and physical aspects. **J. Texture Stud. 16**(4); 1985; 425-49

2200 CHU (CF) and PELEG (M). The compressive behaviour of solid food specimens with small height to diameter ratios. **J. Texture Stud. 16**(4); 1985; 451-64

Cylindrical specimens of height to diameter ratios between 0.12 to 1.0 of potato flesh, bologna sausage and process American cheese were uniaxially compressed to failure. The flatter the specimen the stiffer it appeared. This was also true with respect to strength. The magnitude of strain at failure also increased with the specimen's flatness. Application of two correction procedures for the calculation of a dimensionally independent modulus did not always yield consistent results, demonstrating that the stiffness-strength-shape relationships can depend not only on the material but also on the particular character of the end constraints. AA

## FOOD STORAGE

Nil

## INFESTATION CONTROL AND PESTICIDES

2201 HEBBLETHWAITE (MJ). The application of economics to pre- and post-harvest pest control programmes in developing countries (Review). **Trop. Sci. 25**(3); 1985; 215-30

Discusses: scope of mainstream pest control economics; conventional issues in pest control economics; and potential economic contribution. BSN

2202 REES (DP). Review of the response of stored product insects to light of various wavelengths, with particular reference to the design and use of light traps for population monitoring. **Trop. Sci. 25**(3); 1985; 197-213

Discusses: Experimental light sources for studying the response of insects to light; response of stored product insects to light; and design of light traps. BSN

2203 EDWARDS (JP) and ABRAHAM (L). Laboratory evaluation of two insect juvenile hormone analogues against **Alphitobius diaperinus** (panzer) (Coleoptera: Tenebrionidae). **J. Stored Prod. Res. 21**(4); 1985; 189-94

2204 MIHIHU (SK) and KIBATA (GN). Developing a control programme to combat an outbreak of **Prostephanus truncatus** Horn (Bostrichidae: Coleoptera) in Kenya. **Trop. Sci. 25**(4); 1985; 239-48

2205 HOLLOWAY (GJ). The effect of increased grain moisture content of some life history characteristics of **Sitophilus oryzae** (L.) after staining egg plugs with acid fuchsin. **J. Stored Food Res. 21**(4); 1985; 165-9

Staining with acid fuchsin increases development rate and survival of **Sitophilus oryzae** (L.) from egg to adult. The possibility of strain x treatment interaction has also been observed. BSN.

2206 NAVARRO (S), DIAS (R) and DONAHAYE (E). Induced tolerance of **Sitophilus oryzae** adults to carbon dioxide. **J. Stored Prod. Res. 21**(4); 1985; 207-13

2207 KRISHNARAJAH (SR), GANESALINGAM (VK) and SENANAYAKE (UM). Repellancy and toxicity of some plant oils and their terpene components to **Sitotroga cerealella** (Olivier), (Lepidoptera, Gelechiidae). **Trop. Sci. 25**(4); 1985; 249-52

2208 BOGUS (ER), GALLAGHER (PA), CAMERUN (EA) and MUMMA (RO). Analysis of pesticide exposure pads using selective absorption and elution of

reversed-phase solid support. **J. Agric. Food Chem.** 33(6); 1985; 1018-21

A sensitive, inexpensive procedure has been developed. It involves extraction of the pads with methanol or ethanol, selective adsorption and elution on a reversed-phase solid support and analysis of eluate by HPLC. Two insecticides, carbaryl and diflubenzuron, were tested with the technique on the field and a sensitivity of 50 and 240 ng respectively of residues per pad (103.2 $cm^2$) was obtained. The method allows for work with multiple samples at a time and eliminates the need for more costly organic solvents, liquid/liquid extraction or solvent evaporation steps. MVG

2209 PRICE (NR). The mode of action of fumigants. **J. Stored Prod. Res.** 21(4); 1985; 157-64

Investigations on the action of fumigants - hydrogen cyanide, phosphine, methyl bromide, carbon tetrachloride and ethylene dibromide have been reviewed in order to establish some of the biochemical lesions responsible for the toxicity of fumigants to insects. Further, the modes of action of ethylene oxide, carbon disulphide and methyl chloroform have also been briefly discussed. BSN

## BIOCHEMISTRY AND NUTRITION

2210 HERIAN (AM), KUEHL (NM) and LEE (K). Growth inhibition of **Mycoplasma gallisepticum** following membrane insertion of cholesterol autoxidation products. **J. Food Prot.** 48(12); 1985; 1050-3

Eight cholesterol oxidation products and cholesterol were studied for their ability to support growth of **Mycoplasma gallisepticum.** None of the oxidation products gave better growth than cholesterol. 6-ketocholesterol and cholesterol triol, when substituted for cholesterol, caused significant (78 %) growth inhibition after 42 hours. It was indicated by recovery of radiolabelled 3H-cholesterol triols [1,2,6,7-$3_H$(N)] that 26 % was incorporated into membranes, though minimal or no growth had taken place. Inhibitory effects were assumed to be due to assimilation of cholesterol autoxidation products into the cell membrane. MVG

2211 JIRILLO (R), RUGGERI (P) and FONSECA (G). Evaluation of the presence of some metals in food substitutes. **Ind. Aliment.** 24(11); 1985; 908-10 (Italian)

The authors have measured the contents of Pb, Cd, Cr, Cu, and Zn in a number of commercial food products which contain non-digestible materials instead of normal food ingredients. KMD

2212 KILARA (A). Enzyme-modified protein food ingredients. **Process Biochem.** 20(4); 1985; 149-57

Discusses: Ingredients derived from proteins; guidelines for choosing a protease; flavour problems resulting from hydrolysis; and production of modified ingredients and their uses. BSN

2213 DOKKUM (Wvan) and SINKELDAM (EJ). The importance of dietary fibre for health. Is "too little" less desirable, and is excess harmful? **Voeding.** 46(10); 1985; 331-4 (Dutch)

The influence of wheat fibre on colonic function has been discussed in detail. The effect of increased dietary fibre intake on glucose and lipid metabolism may be of importance in diabetes. The relation between fibre and obesity is less clear. Furthemore, dietary fibre may lower the risk of development of colorectal cancer, though it must be said that the mechanisms involved are not yet fully understood. Any correlation that may be existing between fibre and

ischaemic heart diseases, is probably due to its indirect effect on cholesterol metabolism. One of the adverse effects of an increased dietary fibre intake may be a decreased availability of minerals. Infact, the additional minerals and trace elements provided by a fibre-rich cereals may not be (sufficiently) available to the human organism. BSN

2214 BIJLANI (RL). Dietary fibre: Consensus and controversy. **Prog. Food Nutr. Sci. 9**(3/4); 1985; 343-93

Discusses: Dietary fibre; estimation of fibre; physiological effects; pathological implications; autoatherosceloris and ischaemic heart disease. BSN

2215 SAVOIE (L) and GAUTHIER (SF). Dialysis cell for the in vitro measurement of protein digestibility. **J. Food Sci. 51**(2); 1986; 494-8

A dialysis cell was devised to study in vitro digestion of proteins. The inner reaction vessel (surrounded by a tubular membrane with molecular weight cutoff of 1000) was fized into a cylindrical outer compartment where buffer circulation was provided. The dimensions of compartments, membranes and buffer flow rate were determined with labelled amino acids in order to ensure the most efficient diffusion pattern. For the digestion assay, casein was first hydrolyzed with pepsin (pH 1.9) for 30 minutes. The mixture was then made alkaline (pH 7.5) and poured into the dialysis tube with pancreatin. Nitrogenous material collected with the sodium phosphate buffer was analyzed without further fractionation for the direct measurement of hydrolysis kinetic or of protein digestibility. AA

2216 METSCHIES (M) and SCHWEDT (G). Analysing vitamins in foodstuffs by means of HPLC-sample clean-up on chemically modified silica gels. **Dtsch. Lebensmittel-Rundschau. 81**(12); 1985; 385-7 (German)

The paper presents clean-up procedures on chemically modified silica gels (reversed-phase materials) to determine the vitamins - thiamine, riboflavin and DL-$\alpha$-tocopherol acetate together with the provitamin $\beta$-carotene. Results are presented on analyses effected on a multi-vitamin fruit juice, wheat germs, and a meat extract by means of adsorption or reversed-phase HPLC. For the detection we used UV/VIS photometry as well as fluorimetry. Vitamin contents determined stretched over a range of between 0.6 and 6 mg per 100 g of foodstuff

2217 ANON. Some remarks on the essentiality of giving vitamins A and D supplements to the young child. **Voeding. 46**(7); 1985; 226-7 (Dutch)

2218 LUYKEN (R). The spread of thiamine deficiency, as determined by biochemical methods. **Voeding. 46**(10); 1985; 335-8 (Dutch)

The author has discussed the occurrence of thiamine deficiency in various populations or population groups in the Netherlands, as well as in S.E. Asia and Ghana, and has traced the gradual evolution of methods of thiamine estimation from the time when it was first used by Prof. B.C.P. Jansen in 1937, upto the present. KMD

2219 GOSLINGS (BM). Iodine and prevention of goitre. **Voeding. 46**(12); 1985; 422-6 (Dutch)

Human beings need about 60 ug of iodine (KI) daily for the production of thyroid hormones. The thyroids is capable of regulating uptake of iodide from the blood (or food) within the range of 20 ug to 20 mg per day. According to WHO, the optimum uptake would lie in the range of 150-300 ug, while an uptake > 100 ug may be considered as sufficient. Although the marine fish catch of the Netherlands is quite considerable, the consumption of fish by the population is very low (only 10-15 g/head per day), so that fish supply only 7% of the daily iodine requirement. Milk, eggs, and potatoes may provide another 40

ug/day. Iodinated salt used in bakeries has (60 mg KI/kg salt) and provides about 20 ug iodide per slice of bread, while table salt contains 25 mg KI/kg salt. KMD

## TISSUE CULTURE

Nil

## TOXICOLOGY AND HYGIENE

2220 RAMA DEVI (G) and POLASA (H). Diacetyl - A growth and toxin inhibitor of **Aspergilli. J. Stored Prod. Res. 21**(4); 1985; 195-7

Diacetyl (2,3-butanedione) a food additive, was found to be very effective in inhibiting growth and toxin production of **Aspergillus flavus, A. versicolour** and **A. ochraceus** when grown on synthetic liquid media and on natural substrates of maize and maize flour. Total growth inhibition of **A. flavus** and **A. versicolour** was observed at 250 ppm when grown on liquid medium, whereas 3000-4000 ppm were required to inhibit growth on maize and maize flour. **A. ochraceus** required 3000 and 6000 ppm of diacetyl for complete inhibition of growth on liquid medium and solid substrates respectively, suggesting it was less sensitive to the compound. AA

2221 SCHMIDT (FR) and ESSER (K). Aflatoxins: Medical, economic impact, and propsects for control. **Process Biochem. 20**(6); 1985; 167-74

Discusses: Structure nomenclature and biosynthesis; mode of action; health risks and legislative regulation; economic import; aflatoxin control; post-harvest control; and pre-harvest control. BSN

2222 PESTKA (JJ), LIU (M-T), KNUDSON (BK) and HOGBERG (MG). Immunization of swine for production of antibody against zearalenone. **J. Food Prot. 48**(11); 1985; 953-7

2223 PETERZ (M), WIBERG (C) and NORBERG (P). Comparison of media for isolation of **Bacillus cereus** foods. **J. Food Prot. 48**(11); 1985; 969-70

Three media for isolation of **Bacillus cereus** from foods were compared: mannitol-egg yolk-polymyxin (MYP) agar, polymyxin pyruvate-egg yolk-mannitol-bromothymol blue agar (PEMBA) and non-selective blood agar. Twenty-six of 45 samples of different reconstituted and incubated dry food products and 18 of 29 samples of milk and cream (incubated overnight) contained **B. cereus.** None of the media performed significantly better than the others as regards quantitative recovery or selectivity. AA

2224 BERSANI (C), D'AUBERT (S) and CANTONI (C). Influence of pH and temperature on the growth of psychrotrophic germs. **Ind. Aliment. 24**(11); 1985; 911-4 (Italian)

Growth curves at 3, 6, 15 and 30 C of psychrotrophic gram negative germs in a lactic acid containing medium have been reported in this paper. KMD

2225 SEWARD (RA), LIN (CF) and MELACHOURIS (N). Heat-sensitization of **Salmonella** by polyphosphates. **J. Food Sci. 51**(2); 1986; 471-3, 476

Heat-induced injury of salmonellae in peptone diluent or complex laboratory media was enhanced by polyphosphates, particularly sodium tripolyphosphate. Heat-sensitization was more pronounced with increasing heating time, temperature, or pH, and decreasing inoculum concentration. The heat sensitizing effects of polyphosphates were

dependent upon the composition of the heating medium and the species of **Salmonella**. AA

2226 EASTER (MC) and GIBSON (DM). Rapid and automated detection of salmonella by electrical measurements. **J. Hyg. 94**(3); 1985; 245-62

The method described consists of pre-enrichment in buffered peptone water modified by the addition of dulcitol and trimethylamine oxide, followed by selective enrichment in a selenite-cystine broth with similar modifications. Changes in the conductance of the selective enrichment broth are monitored continuously using a suitable impediometric instrument. Most of the **Salmonella** spp. tested gave a fast (~100 µs/h) and large (> 600 µS) change in conductance, other enteric bacteria much less or no change. KAR

2227 D'AOUST (J-Y) and SEWELL (AM). Detection of **Salmonella** by the enzyme immunoassay (EIA) technique. **J. Food Sci. 51**(2); 1986; 484-8, 507

The MOPC 467 Bio-Enzabead enzyme immunoassay (EIA) identified 335 (92.8%) of 361 **Salmonella** strains tested and gave false positive reactions with 5 (6.5%) of 77 strains of nonsalmonellae. Lack of specificity was particularly prominent with **S. typhi** but not restricted to any one of the 25 somatic groupings represented in this study. Four of the five false-positive reactions were attributed to **Citrobacter freundii**. The EIA assay identified 27 (96%) of 28 naturally contaminated foods and produced 16 (25%) false positive reactions which were mainly associated with **Citrobacter** spp. Attempts at method brevity underlined the importance of M broth post-enrichment and centrifugation for maximum method sensitivity and the inadequacy of EIA for detection of **Salmonella** in preenrichment and enrichment cultures. AA

2228 BAILEY (JS) and COX (NA). Presumptive identification of stock cultures and food isolates as **Salmonella, Shigella,** or **Yersinia** with the enteric pathogen screen. **J. Food Sci. 51**(2); 1986; 526-7

2229 SINHA (RP). Roles of phosphate in influencing resistance to and bacterial uptake of tetracycline and streptomycin in lactic streptococci. **J. Food Prot. 48**(12); 1985; 1025-7

2230 VANDERIET (SJ) and WOODBURN (MJ). Microbial and quality assessment of household food discards. **J. Food Prot. 48**(11); 1985; 924-31

2231 TODD (ECD). Foodborne and waterborne disease in Canada - 1978, annual summary. **J. Food Prot. 48**(11); 1985; 990-96

2232 TODD (ECD). Foodborne and waterborne disease in Canada - 1979, annual summary. **J. Food Prot. 48**(12); 1985; 1071-8

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